

Southern Avenue & Stapley Drive Intersection Safety Study Report

Prepared for the City of Mesa

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1. Purpose

The City of Mesa (City) has requested an intersection safety study for the intersection of Southern Avenue & Stapley Drive. The goal of the safety study is to evaluate recommended geometric improvements for three design stages. The design stages are:

- Opening year (2020)
- Mid-Term year (2030)
- Ultimate year (2040)

The geometric recommendations will assist the City to identify project elements including safety and capacity elements for reapplication of HSIP funding.

2. Study Methodology

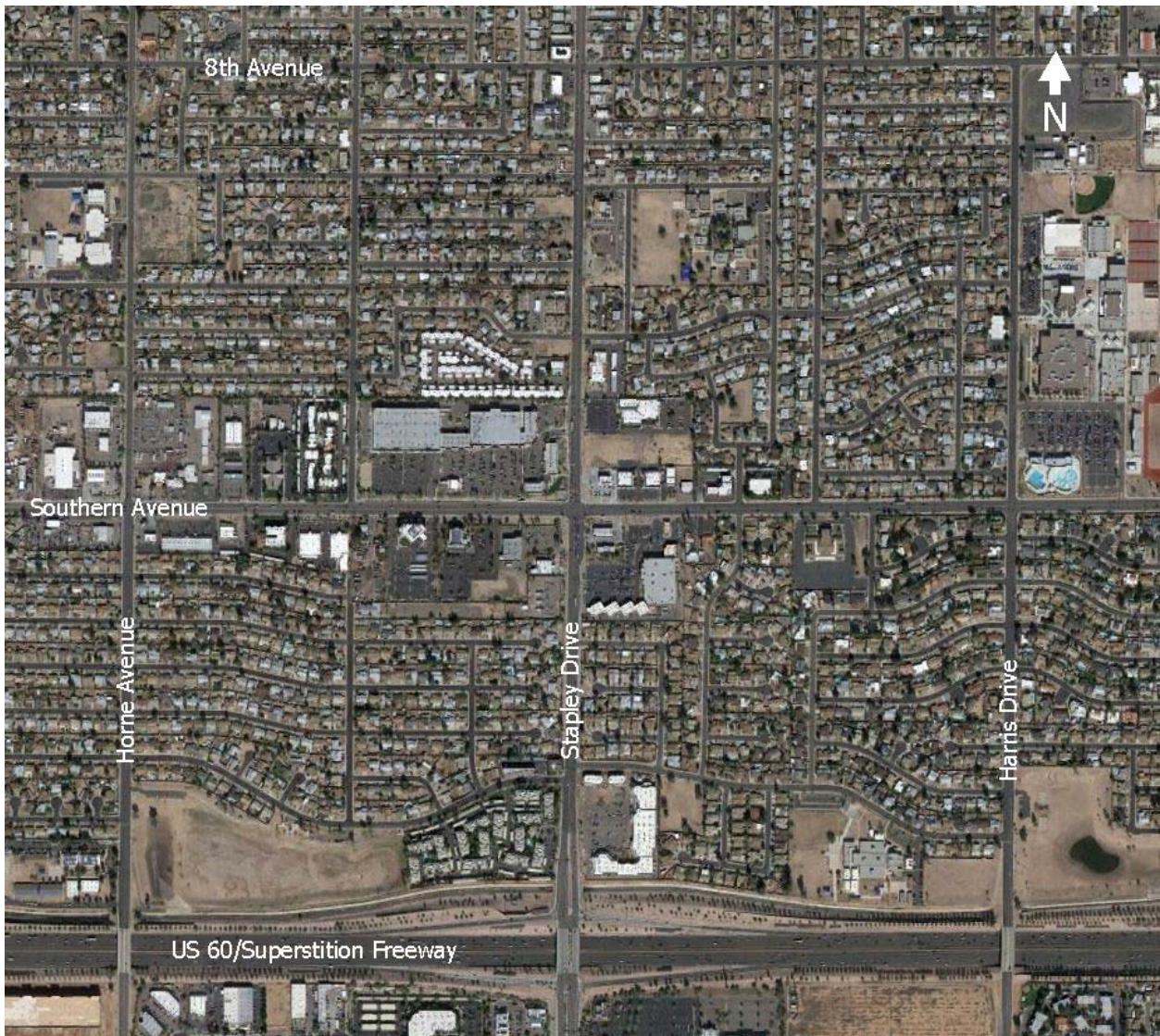
In order to analyze and evaluate the safety concerns and the operational improvements needed, the following tasks were undertaken:

- Field observation of the proposed site and surrounding area was conducted to evaluate the existing physical and operational characteristics of the adjacent roadway network.
- Existing traffic volumes were collected at the intersections of:
 - Southern Avenue/Stapley Drive
 - Stapley Drive/Harmony/Hilton Avenue
- Existing traffic volumes for the US 60/Stapley Drive interchange were provided by City of Mesa.
- A traffic growth rate of 2% was developed based on Maricopa Association of Governments (MAG) traffic projections taken from the City of Mesa 2040 Transportation Plan. The growth rate was used to develop 2020, 2030 and 2040 traffic volumes at the study intersections.
- Crash history for the intersection of Southern Avenue/Stapley Drive from the previous five years was provided by the City of Mesa.
- Existing traffic signal timing and phasing data at the four study intersections was provided by City of Mesa.
- Intersection capacity analyses were performed for existing conditions and the three study years.
- The intersections were analyzed using the methodology presented in the *2010 Highway Capacity Manual (HCM)*.

3. Existing Conditions

The existing intersection of Stapley Drive and Southern Avenue is a major arterial arterial intersection that contains single left turn lanes in all directions. On the north, east, and west approaches of the intersection, there is one exclusive through lane, and a shared through/right turn lane. On the south approach, there are two through lanes, an exclusive right turn lane plus a gore area with chevron striping. Curb, gutter, sidewalk, and pedestrian crosswalk facilities exist at all four approaches to the intersection. Roadway lighting is provided on both sides of all legs at the intersection. Within the vicinity of the study intersection both roadways currently serve vehicles with four lanes, separated by a two-way left turn lane.

Figure 1 – Vicinity Map





The traffic signal currently operates with protected/permissive left turn phasing. The synchro file provided by City of Mesa showed that the traffic signal at Southern Ave/Stapley Drive is coordinated with the following three traffic signals located south on Southern Avenue, Hilton Ave, US 60 Westbound Ramps, and US 60 Eastbound Ramps. All four of the traffic signals are currently operating with a cycle length of 100 seconds during the AM peak hour and 110 seconds during the PM peak hour.

4. Existing and Future Traffic Volume Data

In order to form a basis for analysis of the proposed impacts, weekday AM, Midday and PM peak hour turning movement counts were conducted at the intersections of;

- Southern Avenue/Stapley Drive
- Stapley Drive/Harmony/Hilton Avenue
- Stapley Drive/Westbound US 60 Ramps
- Stapley Drive/Eastbound US 60 Ramps

The weekday turning movement counts were conducted from 7:00 AM to 9:00 AM, 11:00 AM to 1:00 PM and 4:00 PM to 6:00 PM. The traffic counts taken by AZTEC Engineering were completed on September 13th, 2016 while the data provided by City of Mesa was collected on January 27th 2016.

Per City of Mesa direction, existing traffic counts were not adjusted for seasonal factors. The existing weekday AM, Midday and PM peak hour traffic volumes for the Stapley Drive corridor are shown in **Figure 2**. **Figure 3** shows the projected traffic count data for the intersection of Southern Avenue/Stapley Drive which was calculated based on an agreed upon 2% growth rate. Complete traffic count data can be found in the Appendix B.

5. Existing Configuration Traffic Operations

Analysis of current intersection operations was conducted for the weekday AM and PM peak hours using the nationally accepted methodology set forth in the *Highway Capacity Manual*, Transportation Research Board, 2010. The computer software Synchro/Sim Traffic software version 7 was utilized to calculate the levels of service for individual movements and for the intersections as a whole. The base Synchro model was provided by the City of Mesa.

Level of service (LOS) is a qualitative measure of the traffic operations at an intersection or on a roadway segment. Level of service is ranked from LOS A, which signifies little or no congestion and is the highest rank, to LOS F, which signifies congestion and jam conditions. LOS D is typically considered adequate operation at signalized and un-signalized intersections during weekday peak hours.

Figure 2 – Existing Peak Hour Volumes, Stapley Corridor

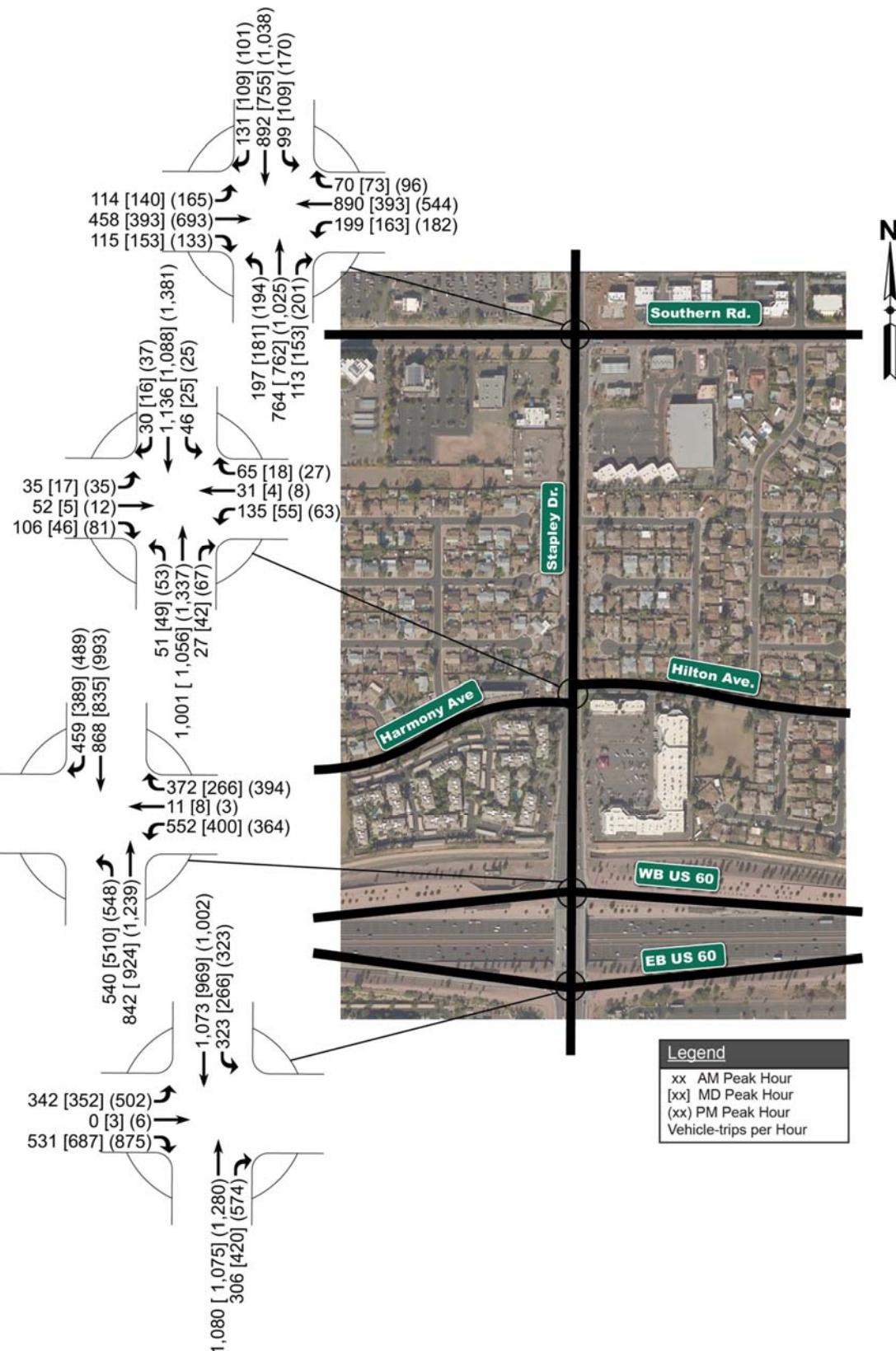
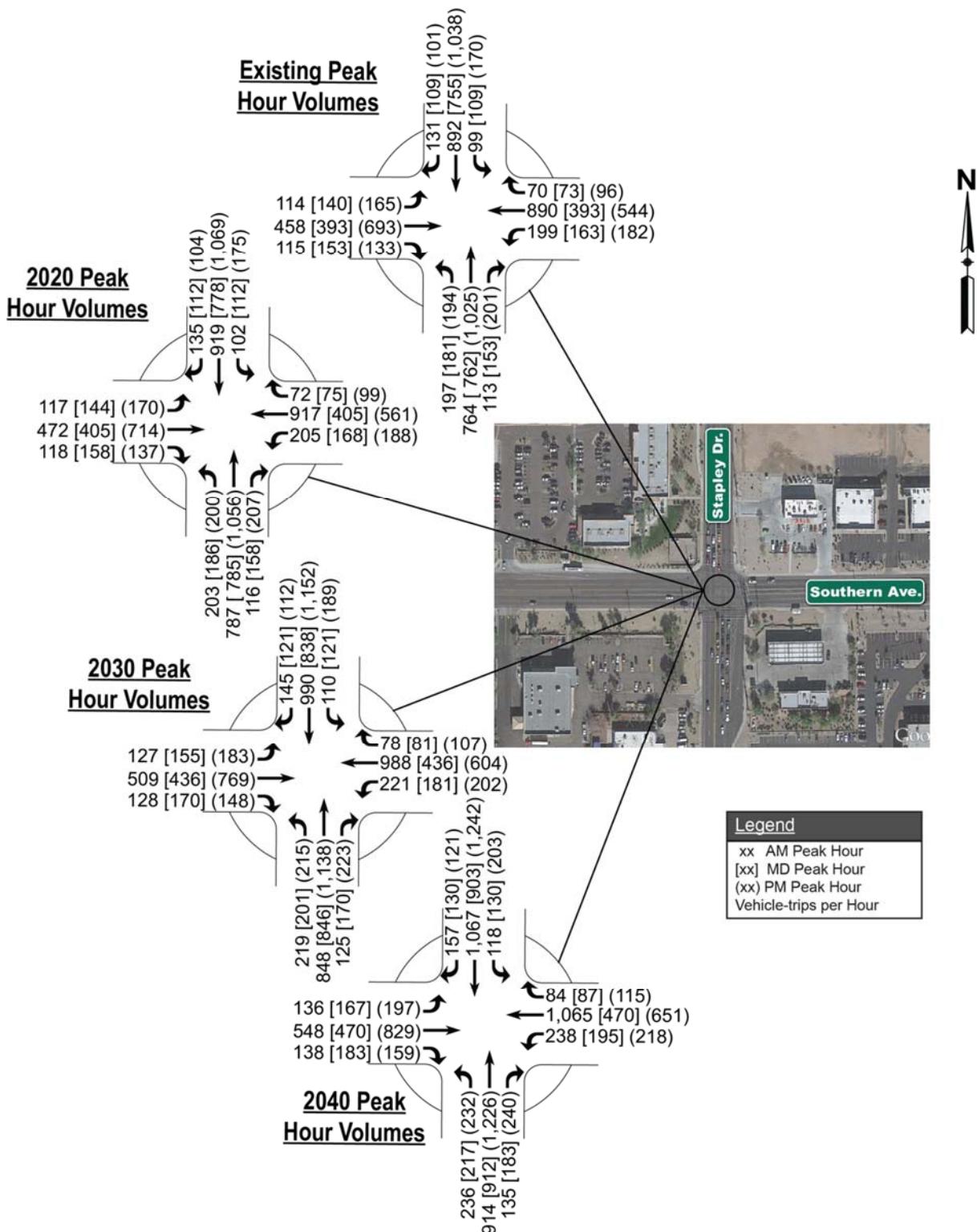




Figure 3 – Projected Peak Hour Volumes, Stapley Dr./Southern Ave.



At signalized intersections, level of service is calculated for each movement and then is summed in a weighted fashion to yield the LOS for the approach and for the intersection as a whole. The criteria for level of service at signalized intersections are shown in **Table 1**.

Table 1 - Level of Service Criteria – Signalized Intersections

Level-of-Service	Average Total Delay
A	\leq 10.0 seconds
B	> 10.0 and \leq 20.0 seconds/vehicle
C	> 20.0 and \leq 35.0 seconds/vehicle
D	> 35.0 and < 55.0 seconds/vehicle
E	> 55.0 and \leq 80.0 seconds/vehicle
F	> 80.0 seconds per vehicle

In calculating the levels of service, level of service default data from the City of Mesa's Synchro model was used, including actuated traffic signal operation and the following assumptions:

- Peak Hour Factor – 0.92
- Cycle Length – 100 sec. AM Peak Hour/110- sec. PM Peak Hour
- Lane Widths – 12 feet
- Yellow Change Interval – 3 seconds
- All-Red Clearance Interval – 1 second
- Approach Grade – 0%

Levels of service were calculated for the study intersection under current geometric conditions using existing, 2020, 2030, and 2040 traffic volumes. The results of this analysis are shown in **Table 2**. Complete capacity calculations are included in the Appendix B.

Table 2 – Peak Hour Levels of Service – Existing Conditions

Intersections	Existing Intersection Configuration															
	Existing Pk Hr Vol.				2020 Pk Hr Vol.				2030 Pk Hr Vol.				2040 Pk Hr Vol.			
	AMPeak		PMPeak		AMPeak		PMPeak		AMPeak		PMPeak		AMPeak		PMPeak	
Signalized Intersections	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Stapley Drive/Southern Avenue																
Overall Intersection	D	39.9	D	43.7	D	43.4	D	47.1	E	55.4	E	59.7	E	73.4	E	78.0
Eastbound Left	C	27.4	D	38.2	C	28.0	D	42.8	C	30.7	D	48.1	C	33.9	E	55.0
Eastbound Through/Right	C	30.8	D	51.6	C	31.3	E	55.3	C	32.6	E	70.2	C	34.1	F	93.0
Westbound Left	C	31.6	D	55.0	C	34.7	E	58.4	D	46.8	E	71.7	E	72.5	F	89.8
Westbound Through/Right	D	47.4	D	40.0	D	51.9	D	41.0	E	68.8	D	43.8	F	95.0	D	48.6
Northbound Left	D	38.0	D	40.4	D	39.7	D	41.5	D	45.7	D	45.6	D	53.2	D	51.2
Northbound Through	C	30.4	D	35.1	C	31.0	D	36.4	C	32.6	D	41.2	C	34.8	D	50.3
Northbound Right	A	4.8	A	7.7	A	4.9	A	8.2	A	5.8	A	9.2	A	6.6	B	10.3
Southbound Left	B	19.8	D	49.6	C	20.5	D	51.5	C	23.3	E	60.9	C	24.9	E	74.4
Southbound Through/Right	D	54.0	D	52.7	E	61.9	E	60.3	F	87.4	F	88.4	F	124.2	F	126.8

Delay - seconds per vehicle

As shown in **Table 2**, the intersection is currently operating at an overall LOS D while all movements are also operating at a LOS D or better. However, the overall intersection LOS and LOS for several turning movements are expected to degrade to F in the future years of 2020-2040. These delays are due to the high volume of northbound and southbound vehicles expected to use the intersection during the future peak hours. These high volumes require a large portion of the total cycle length which in turn is impacting other phases of the traffic signal.

Capacity analysis with existing and future traffic volumes was also conducted for the three other coordinated intersections south of Southern Avenue. The results show that all three intersections currently operate at an overall LOS D or better and are expected to continue doing so during all future study years. Complete capacity calculations for the other coordinated intersections are provided in the Appendix B.

6. Crash History Review

The intersection safety study utilizes crash history from the previous five years provided by the City. The study focuses on the crash history resulting in death or serious injury. A summary of number of crashes and possible injuries at the intersection of Southern Avenue/Stapely Drive are shown in **Tables 3 thru 6**. **Tables 3 and 4** provide an overview of crashes that have occurred within the study period that were intersection related. **Tables 5 and 6** provide an overview of crashes that have occurred within 530 feet of the intersection that are not intersection related.

Table 3 – Crashes on Stapley Drive (Intersection-Related Crashes)

	STUDY YEARS 2011-2015					5 Year Total	Annual Average
	DIRECTION						
	NB	SB	NW	SE			
COLLISION TYPE							
Angle	0	0	0	0	0	0	0
Head On	0	0	0	0	0	0	0
Left Turn	1	0	0	0	1	0.2	
Rear End	1	0	0	0	1	0.2	
Opposite Direction Sideswipe	0	0	0	0	0	0	
Same Direction Sideswipe	0	0	0	0	0	0	
SV	0	0	0	0	0	0	
Totals	2	0	0	0	2	0.4	
CRASH SEVERITY							
Fatal Injury	0	0	0	0	0	0	0
Incapacitating Injury	2	0	0	0	2	0.4	
Totals	2	0	0	0	2	0.4	

Table 4 – Crashes on Southern Avenue (Intersection-Related Crashes)

	STUDY YEARS 2011-2015					5 Year Total	Annual Average
	DIRECTION						
	EB	WB	NE	SW			
COLLISION TYPE							
Angle	0	0	0	0	0	0	0
Head On	0	0	0	0	0	0	0
Left Turn	0	0	0	0	0	0	0
Rear End	0	0	0	0	0	0	0
Opposite Direction Sideswipe	0	0	0	0	0	0	0
Same Direction Sideswipe	0	0	0	0	0	0	0
SV	0	1	0	0	1	0.2	
Totals	0	1	0	0	1	0.2	
CRASH SEVERITY							
Fatal Injury	0	0	0	0	0	0	0
Incapacitating Injury	0	1	0	0	1	0.2	
Totals	0	1	0	0	1	0.2	

Table 5 – Crashes on Stapley Drive (Not Intersection-Related Crashes)

	STUDY YEARS 2011-2015					
	DIRECTION				5 Year Total	Annual Average
	NB	SB	NW	SE		
COLLISION TYPE						
Angle	0	0	0	0	0	0
Head On	0	0	0	0	0	0
Left Turn	0	0	0	0	0	0
Rear End	0	0	0	0	0	0
Opposite Direction Sideswipe	0	0	0	0	0	0
Same Direction Sideswipe	1	0	0	0	1	0.2
SV	0	1	0	0	1	0.2
Totals	1	1	0	0	2	0.4
CRASH SEVERITY						
Fatal Injury	0	0	0	0	0	0
Incapacitating Injury	1	1	0	0	2	0.4
Totals	1	1	0	0	2	0.4

Table 6 – Crashes on Southern Avenue (Not Intersection-Related Crashes)

	STUDY YEARS 2011-2015					Annual Average	
	DIRECTION				5 Year Total		
	EB	WB	SW	NE			
COLLISION TYPE							
Angle	0	1	0	0	1	0.2	
Head On	0	0	0	0	0	0	
Left Turn	1	0	0	0	1	0.2	
Rear End	2	0	0	0	2	0.4	
Opposite Direction Sideswipe	0	0	0	0	0	0	
Same Direction Sideswipe	0	0	0	0	0	0	
SV	0	0	0	0	0	0	
Totals	3	1	0	0	4	0.8	
CRASH SEVERITY							
Fatal Injury	0	0	0	0	0	0	
Incapacitating Injury	3	1	0	0	4	0.8	
Totals	3	1	0	0	4	0.8	

7. Crash Mitigation

As the crash history review shows, during the five year period analyzed there were a total of 3 incapacitating injury related crashes that are possibly mitigatable by intersection related improvements. There are an additional 6 crashes that would possibly be mitigated by improvements made within 530 feet of the intersection approaches. The total crashes averages out to a total number of 1.8 crashes per year.

Table 7 lists the various crash types and are broken out into color-coded categories identifying which crashes can possibly be mitigated by the proposed improvements.

Planned Intersection Improvements

Mitigatable crashes thru planned intersection improvements are highlighted in Yellow in Table 7 and include the addition of a raised median as well as right turn lanes.

Planned Median Improvements

Planned median improvements include the construction of a raised median which would extend a minimum of 530 feet on all approaches. The mitigatable crashes for these improvements are highlighted in Grey in Table 7.

Planned Deceleration Lane Improvements

Proposed deceleration lanes are being proposed as noted in Section 8 – Future Intersection Configurations. The proposed deceleration lanes will all be 250 feet in length. The deceleration lanes will not only provide storage for right turning vehicles but will help separate the right turning vehicles from through movement traffic thus reducing the potential for rear end type collisions as highlighted in Blue in Table 7.



Table 7 – Crashes That Could Be Mitigated By the Planned Improvements

	STUDY YEARS 2011-2015				5 Year Total	Annual Average		
	STAPLEY DRIVE		SOUTHERN AVENUE					
	DIRECTION		DIRECTION					
	NB	SB	EB	WB				
COLLISION TYPE								
Intersection Related - Angle	0	0	0	0	0	0		
Intersection Related - Head On	0	0	0	0	0	0		
Intersection Related - Left Turn	1	0	0	0	1	0.2		
Intersection Related - Rear End	1	0	0	0	1	0.2		
Intersection Related - Opposite Direction Sideswipe	0	0	0	0	0	0		
Intersection Related - Same Direction Sideswipe	0	0	0	0	0	0		
Intersection Related - SV	0	0	0	1	1	0.2		
Within 530 Feet of Intersection - Angle	0	0	0	1	1	0.2		
Within 530 Feet of Intersection - Head On	0	0	0	0	0	0		
Within 530 Feet of Intersection - Left Turn	0	0	1	0	1	0.2		
Rear End Same Direction Sideswipe	1	0	2	0	3	0.6		
Not Intersection Related - SV	0	1	0	0	1	0.2		
Totals	3	1	3	2	9	1.8		
CRASH SEVERITY								
Fatal Injury	0	0	0	0	0	0		
Incapacitating Injury	3	1	3	2	9	1.8		
Totals	3	1	3	2	9	1.8		
Denotes Planned Intersection Improvements								
Denotes Planned Median Improvements								
Denotes Planned Deceleration Improvements								

8. Future Intersection Configurations

Design plans provided by City of Mesa showed an original full-built out for the intersection of Southern Ave./Stapley Dr. that included dual left turn lanes for all approaches, three through lanes for all approaches, and a single eastbound right turn lane. An iterative analysis process was completed at the intersection in order to determine geometrics improvements needed to improve future traffic operations.

Several scenarios were analyzed which included the following improvements:

- Option 1 - The addition of one through lane in the northbound/southbound directions as well as one eastbound right turn lane.
- Option 2 - One new right turn lane for eastbound, westbound, and southbound approaches.

- Option 3 - One new left turn lane for all approaches and an eastbound right turn lane.
- Option 4 - Full build out - one new through lane in northbound/southbound directions, one new left turn lane for all approaches, one new eastbound right turn lane.

The results of the analysis for the different scenarios are shown in **Table 8**. Complete capacity calculations are provided in the Appendix B.

Table 8 – Peak Hour Levels of service – Future Mitigation Scenarios

	Improvements	2020 Peak Hour Volumes				2030 Peak Hour Volumes				2040 Peak Hour Volumes			
		AMPeak		PMPeak		AMPeak		PMPeak		AMPeak		PMPeak	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Signalized Intersections													
Stapley Drive/Southern Avenue	Option 1 - Three NB/SB Through Lanes, EB Right Turn Lane - Prot/Perm Left Turn Phasing (120 sec. cycle length)	C	31.6	C	34.0	C	34.8	D	37.1	D	39.5	D	40.8
Overall Intersection		C	27.2	D	36.4	C	29.8	D	43.2	C	33.4	D	54.8
Eastbound Left		C	28.8	D	43.3	C	28.9	D	45.6	C	30.6	D	51.6
Eastbound Through		A	6.1	A	7.8	A	5.8	A	8.7	A	4.5	A	10.0
Eastbound Right		C	21.8	D	41.6	C	25.1	D	51.3	C	25.1	E	59.3
Westbound Left		D	38.6	D	37.9	D	46.7	D	41.4	D	52.1	D	43.2
Westbound Through/Right		D	39.2	D	43.4	D	51.8	D	48.4	E	63.8	E	60.1
Northbound Left		C	28.6	C	30.8	C	29.7	C	31.5	C	31.9	C	33.8
Northbound Through		A	5.3	A	4.7	A	5.4	A	5.5	A	3.9	A	7.0
Northbound Right		C	21.5	D	35.7	C	22.5	D	51.9	C	26.4	D	52.6
Southbound Left		D	36.3	C	34.0	D	37.0	D	36.3	D	45.4	D	38.6
Southbound Through/Right													
Stapley Drive/Southern Avenue	Option 2 - Add EB, SB, WB Right Turn Lanes - Prot/Perm Left Turn Phasing (120 sec. cycle length)	C	32.4	D	36.8	D	37.1	D	43.1	D	44.1	D	49.3
Overall Intersection		C	27.7	D	38.1	C	30.5	D	46.3	C	33.4	E	55.2
Eastbound Left		C	28.4	D	45.7	C	30.2	D	48.9	C	30.9	E	58.8
Eastbound Through		A	6.0	A	8.0	A	6.1	A	9.1	A	6.0	B	10.7
Eastbound Right		C	28.6	E	59.2	C	33.4	E	72.3	D	37.1	F	112.9
Westbound Left		D	41.4	D	39.0	D	51.0	D	40.0	E	58.8	D	46.4
Westbound Through		A	1.9	A	6.8	A	2.4	A	7.4	A	2.7	A	7.9
Westbound Right		D	51.5	D	51.5	D	51.8	D	49.1	F	134.9	F	111.2
Northbound Left		C	30.6	D	36.2	C	31.7	D	45.3	D	35.3	D	36.4
Northbound Through		A	4.8	A	8.4	A	5.4	B	10.6	A	6.6	A	8.2
Northbound Right		C	21.1	D	41.9	C	23.9	D	41.0	C	26.9	F	120.7
Southbound Left		D	38.6	D	37.7	D	46.2	D	49.9	D	46.5	D	42.6
Southbound Through		A	7.0	A	5.0	A	8.4	A	6.4	A	8.4	A	6.3
Stapley Drive/Southern Avenue	Option 3 - Add Dual EB, SB, WB, NB Left Turn Lanes, Add EB Right Turn Lane - Prot. Only Left Turn Phasing (120 sec. cycle length)	D	43.5	D	43.4	D	49.3	D	46.1	E	56.1	D	51.9
Overall Intersection		E	64.1	E	58.9	E	60.1	E	68.2	E	68.5	F	101.6
Eastbound Left		D	35.6	D	51.8	D	36.0	D	54.5	D	38.2	E	63.9
Eastbound Through		A	5.3	B	11.0	A	6.6	B	11.5	A	6.7	B	13.0
Eastbound Right		E	61.2	E	60.0	E	60.5	E	72.6	E	60.0	F	94.6
Westbound Left		D	48.2	D	47.1	E	60.2	D	48.9	E	72.7	D	51.2
Westbound Through/Right		E	61.1	E	59.2	E	78.2	E	65.0	F	111.8	F	107.0
Northbound Left		C	33.4	D	36.0	D	35.5	D	36.7	C	34.9	D	35.0
Northbound Through		A	3.8	A	9.6	A	8.1	A	9.5	A	5.1	A	8.8
Northbound Right		E	56.9	E	58.3	E	58.7	E	62.0	E	64.3	F	84.5
Southbound Left		D	48.6	D	42.9	D	54.7	D	45.5	E	62.0	D	43.9
Southbound Through/Right													
Stapley Drive/Southern Avenue	Option 4 - Full Build Out (Three Through Lanes and Dual Left Turn Lanes in all directions, EB Right Turn Lane) - Prot. Only Left Turn Phasing (120 sec. cycle length)	C	34.2	D	36.6	D	35.4	D	38.5	D	36.0	D	39.8
Overall Intersection		D	54.2	E	62.6	D	53.6	E	59.8	E	59.8	E	62.8
Eastbound Left		C	30.7	D	39.4	C	31.9	D	40.1	C	32.9	D	43.1
Eastbound Through		A	6.9	A	7.3	A	6.8	A	7.1	A	3.1	A	7.5
Eastbound Right		D	54.4	E	61.8	D	53.8	E	60.9	E	56.7	E	60.4
Westbound Left		C	32.9	D	36.3	D	35.3	D	37.5	D	36.4	D	39.1
Westbound Through/Right		D	54.4	E	60.7	D	53.7	E	60.2	E	56.5	E	61.2
Northbound Left		C	28.1	C	29.5	C	29.0	C	33.9	C	27.8	C	34.6
Northbound Through/Right		D	53.2	E	63.0	D	52.6	E	58.8	E	56.9	E	61.1
Southbound Left		C	33.2	C	30.4	C	35.0	C	33.3	D	35.1	C	34.2
Southbound Through/Right													

Delay - seconds per vehicle



As shown in **Table 8**, Option 3 is expected to operate at an overall LOS E during the AM peak hour of 2040. The three remaining options are all expected to operate at an overall LOS D or better during the future study years. **Table 8** also shows that options 1, 2, and 4 are all expected to experience a LOS E or worse during the AM and PM peak hour for several of their left turn movements. Typically, dual left turn lanes can serve volumes ranging from 300-400 vph with an adequate LOS. However, these delays are due to the dual left turns requiring protected only left turn phasing combined with the 120 cycle length. Left turning vehicles are expected to have to wait an entire cycle length before being able to progress through the intersection which in itself will cause a delay of over 60 seconds.

Due to the results of the capacity analysis, and internal discussion between City of Mesa staff, options 1 and 2 were chosen to move forward to preliminary design cost estimating and crash modification factor analysis.

9. Project Scope of HSIP and Non-HSIP Improvements

Proposed improvements at the Southern Avenue and Stapley Drive Intersection that may be eligible for HSIP State funding include but are not limited to the following:

- Construct through northbound and southbound travel lanes along Stapley Drive (Option1 only).
- Construct raised medians for all approaches for both Options 1 and 2.
- Construct an eastbound deceleration lane for Option 1.
- Construct deceleration lanes for all four approaches for Option 2.

Additional improvements that will be constructed simultaneously to the HSIP funded improvements include but are not limited to the following:

- Undergrounding of 12kV overhead lines
- Constructing and completing bicycle lanes
- Upgrading driveways and curb ramps as needed to meet current ADA standards
- Upgrading the storm drainage system
- Relocating SRP Irrigation
- Relocating 69kV overhead power

10. Cost Estimate

Tables 9 and 10 provides estimated cost summaries of work by phase, which includes design, right-of-way acquisition and construction. The overall total project cost for the overall intersection improvements is estimated at \$7,688,986.59 for Option 1. The overall project cost for Option 2 is estimated at \$8,324,673.91.

Table 9 – Total Estimated Project Costs (HSIP and Roadway) – Option 1

PHASE	TOTAL COSTS
Pre-design	\$ 53,466.00
Design	\$ 497,900.00
Right of Way Acquisition	\$ 454,411.09
TOTAL Construction Cost of Eligible for HSIP Funding - Safety Improvements	\$ 3,802,881.42
TOTAL Construction Cost of Other Roadway Improvements	\$ 2,880,328.08
TOTAL	\$ 7,688,986.59

Table 10 – Total Estimated Project Costs (HSIP and Roadway) – Option 2

PHASE	TOTAL COSTS
Pre-design	\$ 59,328.00
Design	\$ 552,487.00
Right of Way Acquisition	\$ 296,938.35
TOTAL Construction Cost of Eligible for HSIP Funding - Safety Improvements	\$ 4,801,328.56
TOTAL Construction Cost of Other Roadway Improvements	\$ 2,614,592.00
TOTAL	\$ 8,324,673.91

The following information provides a cost breakdown of the associated design costs, right of way acquisition and construction costs.



A. Pre-Design and Design

The total preliminary and final design work, including plans, specifications, construction schedules and final estimates for construction is estimated to cost approximately \$533,822.00 and \$612,155.00 for Options 1 and 2 respectively.

B. Right of Way Acquisition

The total right of way expenditures are estimated to cost \$209,442.66 and \$296,725.31 for Options 1 and 2 respectively as detailed in Tables 11 and 12.

Table 11 – Total Estimated Right of Way Costs (Option 1)

ITEM	QUANTITY (SF)	TOTAL COSTS
Right of Way (Residential)	8,512	\$ 29,790.29
Right of Way (Commercial)	32,462	\$ 324,620.80
Miscelaneous		\$ 100,000.00
TOTAL RIGHT OF WAY		\$ 454,411.09

Table 12 – Total Estimated Right of Way Costs (Option 2)

ITEM	QUANTITY (SF)	TOTAL COSTS
Right of Way (Residential)	120	\$ 420.35
Right of Way (Commercial)	19,652	\$ 196,518.00
Miscelaneous		\$ 100,000.00
TOTAL RIGHT OF WAY		\$ 296,938.35

C. Construction

Tables 13 and 14 detail all items and costs associated with the construction of the proposed safety improvements for HSIP eligible improvements for Options 1 and 2 respectively. The detailed Engineer's Preliminary Construction Cost Estimate is located in Appendix A.

Table 13 – Total Estimated Construction Costs of Safety Improvements (HSIP Eligible) – Option 1

Mobilization, quality Control, Dust and Traffic Control, etc.	\$ 807,500.00
Roadway Work	\$ 544,902.83
Sidewalk work (MAG detail 230)	\$ 115,436.33
Lighting and Signals work (Street lights, light conduits, reconfiguration, mast arm installation, etc.)	\$ 760,400.00
Utility Relocation work (12 kV and 69kV Power Relocations, relocations of transformers and cabinets, miscellaneous, etc.) (Capped at 10% of total construction costs)	\$ -
Signing and Striping work (white and yellow striping work, arrow, etc.)	\$ 77,719.30
Removal work	\$ 339,298.29
SUBTOTAL	\$ 2,645,256.74
Administration and Contingencies (20%)	\$ 529,051.35
TOTAL Construction Cost of Eligible for HSIP Funding - Safety Improvements	\$ 3,174,308.09

Table 14 – Total Estimated Construction Costs of Safety Improvements (HSIP Eligible) – Option 2

Mobilization, quality Control, Dust and Traffic Control, etc.	\$ 807,500.00
Roadway Work	\$ 1,432,922.83
Sidewalk work (MAG detail 230)	\$ 96,037.35
Lighting and Signals work (Street lights, light conduits, reconfiguration, mast arm installation, etc.)	\$ 760,400.00
Utility Relocation work (12 kV and 69kV Power Relocations, relocations of transformers and cabinets, miscellaneous, etc.) (Capped at 10% of total construction costs)	\$ -
Signing and Striping work (white and yellow striping work, arrow, etc.)	\$ 77,719.30
Removal work	\$ 367,267.37
SUBTOTAL	\$ 3,541,846.85
Administration and Contingencies (20%)	\$ 708,369.37
TOTAL Construction Cost of Eligible for HSIP Funding - Safety Improvements	\$ 4,250,216.22

Tables 15 and 16 detail all items and costs associated with the phase (safety and roadway).

Table 15 – Total Estimated Construction Costs of Safety Improvements (HSIP and Roadway) – Option 1

Mobilization, quality Control, Dust and Traffic Control, etc.	\$ 1,615,000.00
Roadway work	\$ 544,902.83
Sidewalk work (MAG detail 230)	\$ 231,126.50
Storm Sewer work (Storm drain, catch basin and drain manhole work, etc.)	\$ 271,410.00
SRP Irrigation work (adjust SRP Irrigation junction box, manholes, structures, etc.)	\$ 521,300.00
Lighting and Signals work (Street lights, light conduits, reconfiguration, mast arm installation, etc.)	\$ 760,400.00
Utility Relocation work (12 kV and 69kV Power Relocations, relocations of transformers and cabinets, miscellaneous, etc.)	\$ 1,505,000.00
Landscaping work (new masonry wall, remove and relocate signs, landscaping, etc.)	\$ 362,641.50
Signing and Striping work (white and yellow striping work, arrow, etc.)	\$ 77,719.30
Removal work	\$ 339,298.29
SUBTOTAL	\$ 6,228,798.42
Administration and Contingencies (20%)	\$ 1,245,759.68
TOTAL Construction Cost	\$ 7,474,558.10

Table 16 – Total Estimated Construction Costs of Safety Improvements (HSIP and Roadway) – Option 2

Mobilization, quality Control, Dust and Traffic Control, etc.	\$ 1,615,000.00
Roadway work	\$ 1,432,922.83
Sidewalk work (MAG detail 230)	\$ 205,321.21
Storm Sewer work (Storm drain, catch basin and drain manhole work, etc.)	\$ 271,410.00
SRP Irrigation work (adjust SRP Irrigation junction box, manholes, structures, etc.)	\$ 521,300.00
Lighting and Signals work (Street lights, light conduits, reconfiguration, mast arm installation, etc.)	\$ 760,400.00
Utility Relocation work (12 kV and 69kV Power Relocations, relocations of transformers and cabinets, miscellaneous, etc.)	\$ 1,505,000.00
Landscaping work (new masonry wall, remove and relocate signs, landscaping, etc.)	\$ 362,641.50
Signing and Striping work (white and yellow striping work, arrow, etc.)	\$ 77,719.30
Removal work	\$ 367,267.37
SUBTOTAL	\$ 7,118,982.21
Administration and Contingencies (20%)	\$ 1,423,796.44
TOTAL Construction Cost	\$ 8,542,778.65

Tables 17 and 18 identify the project funding source for the total project costs for Options 1 and 2 respectively. Based on the 2015 Arizona HSIP Manual (AHSIPM) funding guidelines the cost share for HSIP eligible costs is 94.3% State and 5.7% City. In addition HSIP funding is capped at 10% for both right-of-way purchases and utility relocation/construction and are reflected in the tables accordingly.

Per the AHSIPM funding guidelines the cost of the proposed countermeasure(s) must represent at least 15% of the total construction cost. The proposed countermeasures reflect 37% and 45% of the total construction costs for Options 1 and 2 respectively.

Table 17 – Total Project Costs by Funding Source – Option 1

Item	Total Cost	
	Cost (HSIP Eligible)	Cost (HSIP Non-Eligible)
Pre-design and Design		\$ 551,366.00
Right of Way Acquisition		\$ 454,411.09
Construction	\$ 3,174,308.09	\$ 4,300,250.01
Subtotal (HSIP Eligible)	\$ 3,174,308.09	
Subtotal (HSIP Non-Eligible)		\$ 5,306,027.10
Total Project Cost		\$ 8,480,335.19

Description	Cost	Cost Share
HSIP Eligible	\$ 2,993,372.53	94.3% State Funded
	\$ 180,935.56	5.7% City Funded
Non-HSIP Eligible Project Cost	\$ 5,306,027.10	100% City Funded

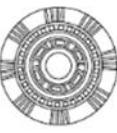


Table 18 – Total Project Costs by Funding Source – Option 2

Item	Total Cost	
	Cost (HSIP Eligible)	Cost (HSIP Non-Eligible)
Pre-design and Design		\$ 611,815.00
Right of Way Acquisition		\$ 296,938.35
Construction	\$ 4,250,216.22	\$ 4,292,562.43
Subtotal (HSIP Eligible)	\$ 4,250,216.22	
Subtotal (HSIP Non-Eligible)		\$ 5,201,315.78
Total Project Cost		\$ 9,451,532.00

Description	Cost	Cost Share
HSIP Eligible	\$ 4,007,953.90	94.3% State Funded
	\$ 242,262.32	5.7% City Funded
Non-HSIP Eligible Project Cost	\$ 5,201,315.78	100% City Funded



11. Benefit/Cost Ratio Analysis

The purpose of the Benefit/Cost (B/C) Ratio analysis is to evaluate whether implementing proposed safety improvements will reduce the number of fatal and serious injury crashes on a monetary basis. The B/C Ratio analysis will compare the costs of implementing safety countermeasures to the benefits of reducing fatal and serious injury type crashes. Each type of crash injury is assigned a specific Unit Cost or benefit. A B/C Ratio is calculated by dividing the annual benefit by the annual construction cost for the proposed countermeasures.

The procedure used for determining the B/C Ratio is defined in Appendices A, B and C of the AHSIPM. The calculated B/C Ratio must be ≥ 1.5 (rounded to the nearest tenth) in order to be eligible for HSIP funding.

A. Crash Reduction and Composite Reduction Factors

A Crash Reduction Factor (CRF) is defined as the total percentage reduction in the number of crashes that can be expected after implementing proposed countermeasure.

According to the AHSIPM only 4 or 5 star countermeasures from ADOT's list (See Appendix B) or FHWA's Crash modification Factors Clearinghouse may be used.

A maximum of 3 countermeasures can be used in a Combined Crash Reduction Factor (CCRF). Since the crash type, severity and area vary the following formula will be used as noted in Appendix A of the AHSIPM.

$$CCRF = (CRF1 \times \text{no. of crashes of countermeasure 1}) / (\text{total crashes}) + (CRF2 \times \text{no. of crashes of countermeasure 2}) / (\text{total crashes}) + (CRF3 \times \text{no. of crashes of countermeasure 3}) / (\text{total crashes})$$

The following Tables 19 and 20 lists the CRFs for each of the proposed countermeasures and their calculated CCRF for Options 1 and 2 respectively.

Table 19 – Crash Reduction and Composite Crash Reduction Factors – Option 1

Improvements	Referenced Used per Type of Improvement	Reduction In Crash Rates		
		All Crashes	Fatal	Incapacitating Injury
Construct Additional Thru Lane	CMF Clearinghouse - CMF ID 7929 - "Assessment of safety effects for widening urban roadways in developing crash modification functions using nonlinearizing link functions"	0.761	0.761	0.761
Construct Raised Medians	CMF Clearinghouse - CMF ID 21 - "Provide a Raised Median"	0.61	0.61	0.61
Construct Deceleration Lanes	CMF Clearinghouse - CMF ID 288 - "Provide a Right-Turn Lane on One Major-road Approach"	0.91	0.91	0.91
CCRF = (CRF1 x no. of crashes for countermeasure 1) ÷ (total crashes) + (CRF2 x no. of crashes for countermeasure 2) ÷ (total crashes) + (CRF3 x no. of crashes for countermeasure 3) ÷ (total crashes)	All Project	0.76	0.76	0.76

Table 20 – Crash Reduction and Composite Crash Reduction Factors – Option 2

Improvements	Referenced Used per Type of Improvement	Reduction Crash Rates		
		All Crashes	Fatal	Incapacitating Injury
Construct Raised Medians	CMF Clearinghouse - CMF ID 21 - "Provide a Raised Median"	0.61	0.61	0.61
Construct Deceleration Lanes	CMF Clearinghouse - CMF ID 288 - "Provide a Right-Turn Lane on One Major-road Approach"	0.91	0.91	0.91
CCRF = (CRF1 x no. of crashes for countermeasure 1) ÷ (total crashes) + (CRF2 x no. of crashes for countermeasure 2) ÷ (total crashes) + (CRF3 x no. of crashes for countermeasure 3) ÷ (total crashes)	All Project	0.76	0.76	0.76

B. Cost Assumptions

Tables 21 and 22 list cost assumptions including interest and maintenance costs over a 20 year project life in order to establish an annual construction cost for Options 1 and 2 respectively.



Table 21 – Cost Assumptions – Option 1

Total Construction Cost (Proposed eligible for HSIP without match)	\$ 3,174,308.09
Project Life (Years)	20
Interest Rate (%)	0.08
Capital Recovery Factor	0.1019
Annual Construction Cost = CRF X Total Const. Cost (A)	\$ 323,461.99
Annual Maintenance Cost Difference (if applicable) (B)	\$ -
Total Annual Cost (A+B)	\$ 323,461.99

Table 22 – Cost Assumptions – Option 2

Total Construction Cost (Proposed eligible for HSIP without match)	\$ 4,250,216.22
Project Life (Years)	20
Interest Rate (%)	0.08
Capital Recovery Factor	0.1019
Annual Construction Cost = CRF X Total Const. Cost (A)	\$ 433,097.03
Annual Maintenance Cost Difference (if applicable) (B)	\$ -
Total Annual Cost (A+B)	\$ 433,097.03

C. Benefit/Cost Ratio Calculations

Tables 23 and 24 provides the B/C Ratio calculations. The first step is to calculate the Annual Benefit based on a monetary basis. The equation used is as follows:

$$\text{Annual Benefit} (\$) = \text{Annual Average (per crash type)} \times (\text{CCRF}) \times (\text{Unit Cost of Crash Severity})$$

The unit costs for Fatal and Incapacitated Injury are \$5,800,000.00 and \$400,000.00 respectively.

Table 23 – Benefit/Cost Ratio Calculation Worksheet – Option 1

BENEFITS					
Crash Types	Annual Average	Crash Reduction Factor	Total Reduction	Unit Cost	Annual Benefit
Fatal	0	76%	0	\$ 5,800,000.00	\$ -
Incapacited Injury	1.8	76%	1.3686	\$ 400,000.00	\$ 547,440.00
					Total Annual Benefit \$ 547,440.00
COSTS					
Total Construction Cost/Year					\$ 3,174,308
Project Life (Years)					20
Interest Rate (%)					0.08
Capital Recovery Factor (CRF)					0.1019
Annual Construction Cost = CRF x Total Construction Cost (A)					\$ 323,461.99
Annual Maintenance Cost Difference (if applicable) (B)					\$ -
Total Annual Cost: (A + B)					\$ 323,461.99
BENEFIT/COST					
Annual Benefit			Annual Cost		Benefit/Cost Ratio
\$ 547,440.00			\$ 323,461.99		1.7

Table 24 – Benefit/Cost Ratio Calculation Worksheet – Option 2

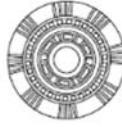
BENEFITS					
Crash Types	Annual Average	Crash Reduction Factor	Total Reduction	Unit Cost	Annual Benefit
Fatal	0	76%	0	\$ 5,800,000.00	\$ -
Incapacited Injury	1.8	76%	1.3686	\$ 400,000.00	\$ 547,440.00
					Total Annual Benefit \$ 547,440.00
COSTS					
Total Construction Cost					\$ 4,250,216
Project Life (Years)					20
Interest Rate (%)					0.08
Capital Recovery Factor (CRF)					0.1019
Annual Construction Cost = CRF x Total Construction Cost (A)					\$ 433,097.03
Annual Maintenance Cost Difference (if applicable) (B)					\$ -
Total Annual Cost: (A + B)					\$ 433,097.03
BENEFIT/COST					
Annual Benefit			Annual Cost		Benefit/Cost Ratio
\$ 547,440.00			\$ 433,097.03		1.3

12. Conclusions

The Benefit/Cost Ratio Analysis for the Intersection of Southern Avenue and Stapley Drive yield ratios of 1.7 and 1.3 for Options 1 and 2 respectively. For this analysis right-of-way and utility relocation/construction sharing (capped at 10%) was not utilized in order to lower the total HSIP eligible construction costs. Additional refinements in unit costs and/or quantities may be reviewed in finer detail in order to meet the 1.5 B/C Ratio for Option 2 if Option 2 is the preferred option based on need.



APPENDIX A
ENGINEER'S PRELIMINARY CONSTRUCTION COST ESTIMATE


Engineer's Preliminary Construction Cost Estimate

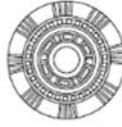
City of Mesa
Southern Avenue & Stapley Drive Improvements
 Project No. AZE1448-05
 Option 1 - Total

Item Number	Description	Unit	Quantity	Unit Price	Cost
1	Mobilization/Demobilization	LSUM	1	\$ 500,000.00	\$ 500,000.00
2	Storm Water Pollution Prevention Plan	LSUM	1	\$ 100,000.00	\$ 100,000.00
3	Survey & As-Builts	LSUM	1	\$ 200,000.00	\$ 200,000.00
4	Quality Control & Material Testing	LSUM	1	\$ 175,000.00	\$ 175,000.00
5	Construction Water	LSUM	1	\$ 100,000.00	\$ 100,000.00
6	Dust Control	LSUM	1	\$ 90,000.00	\$ 90,000.00
7	Traffic Control	LSUM	1	\$ 450,000.00	\$ 450,000.00
				Subtotal =	\$ 1,615,000.00
8	5.5" AC Pavement over 10" Aggregate Base Course	SY	9054.816	\$ 32.00	\$ 289,754.10
9	2" Mill and Replace Pavement	SY	0	\$ 9.00	\$ -
10	6" Vertical Curb and Gutter per MAG Detail 220 Type A	LF	7644.33	\$ 9.00	\$ 68,798.97
11	6" Single Curb per MAG Detail 220	LF	6946.64	\$ 9.00	\$ 62,519.76
12	Reset Survey Marker (MAG Detail 120-1 Type A)	EA	16	\$ 120.00	\$ 1,920.00
13	Adjust Sewer Manhole & Cover Frame per MAG Detail 422	EA	37	\$ 350.00	\$ 12,950.00
14	Adjust Frame and Cover per MAG Detail 391-2	EA	52	\$ 300.00	\$ 15,600.00
15	Sawcut, Remove and Replace Asphalt for Storm Drain Trench	SY	2334	\$ 40.00	\$ 93,360.00
				Subtotal Roadway =	\$ 544,902.83
16	Sidewalk per MAG Detail 230	SF	46174.53	\$ 2.50	\$ 115,436.33
17	Sidewalk Ramp per MAG Detail 231 Type A	EA	7	\$ 1,000.00	\$ 7,000.00
18	Sidewalk Ramp per MAG Detail 233	EA	1	\$ 1,000.00	\$ 1,000.00
19	Dual Sidewalk Ramp per XXXX	EA	9	\$ 1,300.00	\$ 11,700.00
20	Bus Bay per City of Mesa Detail 45.1	SF	4262.64	\$ 6.00	\$ 25,575.84
21	Valley Gutter and Apron per MAG 240	SF	3661.41	\$ 5.50	\$ 20,137.76
22	Driveway per City of Mesa Detail M-40.1	SF	8379.43	\$ 6.00	\$ 50,276.58
				Subtotal Sidewalk =	\$ 231,126.50
23	48" Storm Drain Pipe	LF	664	\$ 100.00	\$ 66,400.00
24	42" Storm Drain Pipe	LF	0	\$ 90.00	\$ -
25	36" Storm Drain Pipe	LF	1357	\$ 70.00	\$ 94,990.00
26	24" Storm Drain Pipe	LF	0	\$ 50.00	\$ -
27	15" Storm Drain Pipe	LF	313	\$ 40.00	\$ 12,520.00
28	Catch Basin - City of Mesa Detail M-64	EA	21	\$ 2,500.00	\$ 52,500.00
29	5' Diameter Storm Drain Manhole per MAG Details 520 & 522	EA	18	\$ 2,500.00	\$ 45,000.00
				Subtotal Storm Sewer =	\$ 271,410.00
30	Irrigation Delivery Structure	EA	3	\$ 15,000.00	\$ 45,000.00
31	Irrigation Private Junction Box	EA	4	\$ 11,000.00	\$ 44,000.00
32	Irrigation Manhole	EA	6	\$ 4,800.00	\$ 28,800.00
33	Adjust Irrigation Manhole	EA	1	\$ 3,500.00	\$ 3,500.00
34	24" RGRCP Irrigation Pipe	LF	1160	\$ 50.00	\$ 58,000.00
35	36" RGRCP Irrigation Pipe	LF	3345	\$ 70.00	\$ 234,150.00
36	42" RGRCP Irrigation Pipe	LF	940	\$ 90.00	\$ 84,600.00
37	Irrigation Structure (Private Junction Box)	EA	1	\$ 5,000.00	\$ 5,000.00
38	24" RGRCP (Private Irrigation)	LF	365	\$ 50.00	\$ 18,250.00
				Subtotal SRP Irrigation =	\$ 521,300.00
39	Street Light	EA	10	\$ 4,000.00	\$ 40,000.00
40	Relocate Existing Streetlight	EA	25	\$ 2,000.00	\$ 50,000.00
41	Install New Double Mast Arm Streetlight (Median)	EA	8	\$ 6,000.00	\$ 48,000.00
42	Street Light Conduit (2")	LF	3200	\$ 7.00	\$ 22,400.00
43	Reconfigure Traffic Signals at Southern and Stapley	LSUM	1	\$ 400,000.00	\$ 400,000.00
44	Reconfigure Traffic Signals at Hilton and Stapley	LSUM	1	\$ 200,000.00	\$ 200,000.00
				Subtotal Lighting & Signals =	\$ 760,400.00
45	12kV Power Pole Relocation	EA	6	\$ 10,000.00	\$ 60,000.00
46	69 KV Power Pole Relocation	EA	19	\$ 35,000.00	\$ 665,000.00
47	69 KV Power Pole Relocation (Large Diameter)	EA	6	\$ 80,000.00	\$ 480,000.00
48	Relocate Transformer/Switching Cabinet	EA	10	\$ 20,000.00	\$ 200,000.00
49	Misc Utility Relocations	LSUM	1	\$ 100,000.00	\$ 100,000.00
				Subtotal Utility Relocations =	\$ 1,505,000.00
50	New Masonry Wall	LF	2017	\$ 150.00	\$ 302,550.00
51	Remove and Relocate Existing Sign	EA	7	\$ 5,000.00	\$ 35,000.00
52	New Chain Link Fence	LF	540	\$ 11.00	\$ 5,940.00
53	Landscaping	SF	38303	\$ 0.50	\$ 19,151.50
				Subtotal Landscaping Features =	\$ 362,641.50

Engineer's Preliminary Construction Cost Estimate

City of Mesa
Southern Avenue & Stapley Drive Improvements
 Project No. AZE1448-05
 Option 1 - Total

Item Number	Description	Unit	Quantity	Unit Price	Cost
54	Sign Post and Foundation	EA	43	\$ 200.00	\$ 8,600.00
55	Obliterate Existing Striping	LF	22065	\$ 0.90	\$ 19,858.50
56	4" White Striping	LF	17341	\$ 0.60	\$ 10,404.60
57	8" White Striping	LF	10139	\$ 1.20	\$ 12,166.80
58	12" White Striping	LF	2446	\$ 2.10	\$ 5,136.60
59	18" White Striping	LF	516	\$ 3.20	\$ 1,651.20
60	4" Yellow Striping	LF	15836	\$ 0.60	\$ 9,501.60
61	Arrow Symbol	EA	32	\$ 160.00	\$ 5,120.00
62	Bike Lane Symbol	EA	33	\$ 160.00	\$ 5,280.00
Subtotal Signing & Striping = \$					77,719.30
63	Remove Existing Pavement	SY	32229.1	\$ 3.00	\$ 96,687.30
64	Remove Existing Curb	LF	3748.87	\$ 7.00	\$ 26,242.09
65	Remove Existing Concrete Sidewalk and Driveway	SF	71870	\$ 1.50	\$ 107,805.00
66	Remove Existing Wall	LF	328	\$ 10.00	\$ 3,280.00
67	Remove Existing Fence	LF	432	\$ 2.00	\$ 864.00
68	Remove Existing Catch Basin	EA	18	\$ 500.00	\$ 9,000.00
69	Remove Existing Irrigation Pipe	LF	4624	\$ 15.00	\$ 69,360.00
70	Remove Existing Street Light	EA	6	\$ 500.00	\$ 3,000.00
71	Remove Existing Trees	EA	64	\$ 200.00	\$ 12,800.00
72	Remove Existing Landscaping	SF	102599	\$ 0.10	\$ 10,259.90
Subtotal Removals = \$					339,298.29
73	Right of Way (Residential)	SF	8511.51	\$ 3.50	\$ 29,790.29
74	Right of Way (Commercial)	SF	32462.08	\$ 10.00	\$ 324,620.80
75	Miscellaneous Residential Modifications	LSUM	1	\$ 100,000.00	\$ 100,000.00
Subtotal Right of Way = \$					454,411.09
Subtotal = \$					6,683,209.50
Contingency (20%) = \$					1,336,641.90
Total = \$					8,019,851.40


Engineer's Preliminary Construction Cost Estimate

City of Mesa
Southern Avenue & Stapley Drive Improvements
 Project No. AZE1448-05
 Option 2 - Total

Item Number	Description	Unit	Quantity	Unit Price	Cost
1	Mobilization/Demobilization	LSUM	1	\$ 500,000.00	\$ 500,000.00
2	Storm Water Pollution Prevention Plan	LSUM	1	\$ 100,000.00	\$ 100,000.00
3	Survey & As-Builts	LSUM	1	\$ 200,000.00	\$ 200,000.00
4	Quality Control & Material Testing	LSUM	1	\$ 175,000.00	\$ 175,000.00
5	Construction Water	LSUM	1	\$ 100,000.00	\$ 100,000.00
6	Dust Control	LSUM	1	\$ 90,000.00	\$ 90,000.00
7	Traffic Control	LSUM	1	\$ 450,000.00	\$ 450,000.00
				Subtotal =	\$ 1,615,000.00
8	5.5" AC Pavement over 10" Aggregate Base Course	SY	39893.35	\$ 32.00	\$ 1,276,587.20
9	2" Mill and Replace Pavement	SY	0	\$ 9.00	\$ -
10	6" Vertical Curb and Gutter per MAG Detail 220 Type A	LF	7214.89	\$ 9.00	\$ 64,934.01
11	6" Single Curb per MAG Detail 220	LF	6770.18	\$ 9.00	\$ 60,931.62
12	Reset Survey Marker (MAG Detail 120-1 Type A)	EA	16	\$ 120.00	\$ 1,920.00
13	Adjust Sewer Manhole & Cover Frame per MAG Detail 422	EA	37	\$ 350.00	\$ 12,950.00
14	Adjust Frame and Cover per MAG Detail 391-2	EA	52	\$ 300.00	\$ 15,600.00
15	Sawcut, Remove and Replace Asphalt for Storm Drain Trench	SY	0	\$ 40.00	\$ -
				Subtotal Roadway =	\$ 1,432,922.83
16	Sidewalk per MAG Detail 230	SF	38414.94	\$ 2.50	\$ 96,037.35
17	Sidewalk Ramp per MAG Detail 231 Type A	EA	4	\$ 1,000.00	\$ 4,000.00
18	Sidewalk Ramp per MAG Detail 233	EA	1	\$ 1,000.00	\$ 1,000.00
19	Dual Sidewalk Ramp per XXXX	EA	9	\$ 1,300.00	\$ 11,700.00
20	Bus Bay per City of Mesa Detail 45.1	SF	4251.97	\$ 6.00	\$ 25,511.82
21	Valley Gutter and Apron per MAG 240	SF	5369.37	\$ 5.50	\$ 29,531.54
22	Driveway per City of Mesa Detail M-40.1	SF	6256.75	\$ 6.00	\$ 37,540.50
				Subtotal Sidewalk =	\$ 205,321.21
23	48" Storm Drain Pipe	LF	664	\$ 100.00	\$ 66,400.00
24	42" Storm Drain Pipe	LF	0	\$ 90.00	\$ -
25	36" Storm Drain Pipe	LF	1357	\$ 70.00	\$ 94,990.00
26	24" Storm Drain Pipe	LF	0	\$ 50.00	\$ -
27	15" Storm Drain Pipe	LF	313	\$ 40.00	\$ 12,520.00
28	Catch Basin - City of Mesa Detail M-64	EA	21	\$ 2,500.00	\$ 52,500.00
29	5' Diameter Storm Drain Manhole per MAG Details 520 & 522	EA	18	\$ 2,500.00	\$ 45,000.00
				Subtotal Storm Sewer =	\$ 271,410.00
30	Irrigation Delivery Structure	EA	3	\$ 15,000.00	\$ 45,000.00
31	Irrigation Private Junction Box	EA	4	\$ 11,000.00	\$ 44,000.00
32	Irrigation Manhole	EA	6	\$ 4,800.00	\$ 28,800.00
33	Adjust Irrigation Manhole	EA	1	\$ 3,500.00	\$ 3,500.00
34	24" RGRCP Irrigation Pipe	LF	1160	\$ 50.00	\$ 58,000.00
35	36" RGRCP Irrigation Pipe	LF	3345	\$ 70.00	\$ 234,150.00
36	42" RGRCP Irrigation Pipe	LF	940	\$ 90.00	\$ 84,600.00
37	Irrigation Structure (Private Junction Box)	EA	1	\$ 5,000.00	\$ 5,000.00
38	24" RGRCP (Private Irrigation)	LF	365	\$ 50.00	\$ 18,250.00
				Subtotal SRP Irrigation =	\$ 521,300.00
39	Street Light	EA	10	\$ 4,000.00	\$ 40,000.00
40	Relocate Existing Streetlight	EA	25	\$ 2,000.00	\$ 50,000.00
41	Install New Double Mast Arm Streetlight (Median)	EA	8	\$ 6,000.00	\$ 48,000.00
42	Street Light Conduit (2")	LF	3200	\$ 7.00	\$ 22,400.00
43	Reconfigure Traffic Signals at Southern and Stapley	LSUM	1	\$ 400,000.00	\$ 400,000.00
44	Reconfigure Traffic Signals at Hilton and Stapley	LSUM	1	\$ 200,000.00	\$ 200,000.00
				Subtotal Lighting & Signals =	\$ 760,400.00
45	12kV Power Pole Relocation	EA	6	\$ 10,000.00	\$ 60,000.00
46	69 KV Power Pole Relocation	EA	19	\$ 35,000.00	\$ 665,000.00
47	69 KV Power Pole Relocation (Large Diameter)	EA	6	\$ 80,000.00	\$ 480,000.00
48	Relocate Transformer/Switching Cabinet	EA	10	\$ 20,000.00	\$ 200,000.00
49	Misc Utility Relocations	LSUM	1	\$ 100,000.00	\$ 100,000.00
				Subtotal Utility Relocations =	\$ 1,505,000.00
50	New Masonry Wall	LF	2017	\$ 150.00	\$ 302,550.00
51	Remove and Relocate Existing Sign	EA	7	\$ 5,000.00	\$ 35,000.00
52	New Chain Link Fence	LF	540	\$ 11.00	\$ 5,940.00
53	Landscaping	SF	38303	\$ 0.50	\$ 19,151.50
				Subtotal Landscaping Features =	\$ 362,641.50


Engineer's Preliminary Construction Cost Estimate

City of Mesa
Southern Avenue & Stapley Drive Improvements
 Project No. AZE1448-05
 Option 2 - Total

Item Number	Description	Unit	Quantity	Unit Price	Cost
54	Sign Post and Foundation	EA	43	\$ 200.00	\$ 8,600.00
55	Obliterate Existing Striping	LF	22065	\$ 0.90	\$ 19,858.50
56	4" White Striping	LF	17341	\$ 0.60	\$ 10,404.60
57	8" White Striping	LF	10139	\$ 1.20	\$ 12,166.80
58	12" White Striping	LF	2446	\$ 2.10	\$ 5,136.60
59	18" White Striping	LF	516	\$ 3.20	\$ 1,651.20
60	4" Yellow Striping	LF	15836	\$ 0.60	\$ 9,501.60
61	Arrow Symbol	EA	32	\$ 160.00	\$ 5,120.00
62	Bike Lane Symbol	EA	33	\$ 160.00	\$ 5,280.00
Subtotal Signing & Striping = \$					77,719.30
63	Remove Existing Pavement	SY	33844.73	\$ 3.00	\$ 101,534.19
64	Remove Existing Curb	LF	7052.04	\$ 7.00	\$ 49,364.28
65	Remove Existing Concrete Sidewalk and Driveway	SF	71870	\$ 1.50	\$ 107,805.00
66	Remove Existing Wall	LF	328	\$ 10.00	\$ 3,280.00
67	Remove Existing Fence	LF	432	\$ 2.00	\$ 864.00
68	Remove Existing Catch Basin	EA	18	\$ 500.00	\$ 9,000.00
69	Remove Existing Irrigation Pipe	LF	4624	\$ 15.00	\$ 69,360.00
70	Remove Existing Street Light	EA	6	\$ 500.00	\$ 3,000.00
71	Remove Existing Trees	EA	64	\$ 200.00	\$ 12,800.00
72	Remove Existing Landscaping	SF	102599	\$ 0.10	\$ 10,259.90
Subtotal Removals = \$					367,267.37
73	Right of Way (Residential)	SF	120.10	\$ 3.50	\$ 420.35
74	Right of Way (Commercial)	SF	19651.8	\$ 10.00	\$ 196,518.00
75	Miscellaneous Residential Modifications	LSUM	1	\$ 100,000.00	\$ 100,000.00
Subtotal Right of Way = \$					296,938.35
Subtotal = \$					7,415,920.56
Contingency (20%) = \$					1,483,184.11
Total = \$					8,899,104.67

APPENDIX B
TRAFFIC COUNT DATA AND CAPACITY CALCULATIONS

Stapley Drive Optimization

Existing Conditions

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↑	↔	↑	↑	↑↑	↑↑↑	↑↑↑↑	↑↑↑↑↑	↑
Traffic Volume (vph)	0	0	0	552	11	372	540	842	0	0	868	459
Future Volume (vph)	0	0	0	552	11	372	540	842	0	0	868	459
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	265		265	260		0	250		250
Storage Lanes	0		0	1		1	2		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	0.97	0.91	1.00	1.00	0.81	1.00
Fr _t					0.962	0.850						0.850
Flt Protected					0.950	0.966		0.950				
Satd. Flow (prot)	0	0	0	1681	1575	1504	3433	5085	0	0	7544	1583
Flt Permitted					0.950	0.966		0.950				
Satd. Flow (perm)	0	0	0	1681	1575	1504	3433	5085	0	0	7544	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					18	129						499
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1284			1162			538			373	
Travel Time (s)		29.2			26.4			12.2			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	600	12	404	587	915	0	0	943	499
Shared Lane Traffic (%)				41%		22%						
Lane Group Flow (vph)	0	0	0	354	347	315	587	915	0	0	943	499
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2	1	1	2			2	1
Detector Template				Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)				20	100	20	20	100			100	20
Trailing Detector (ft)				0	0	0	0	0			0	0
Detector 1 Position(ft)				0	0	0	0	0			0	0
Detector 1 Size(ft)				20	6	20	20	6			6	20
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94		94				94	
Detector 2 Size(ft)					6		6				6	
Detector 2 Type					Cl+Ex		Cl+Ex				Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)						0.0		0.0			0.0	
Turn Type					Split	NA	Perm	Prot	NA		NA	Perm
Protected Phases				8	8		7	2 6 7			2	
Permitted Phases						8						2

Stapley Drive Optimization
681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

Existing Conditions
AM Peak Hour

Lane Group	Ø3	Ø4	Ø6
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Fr _t			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	3	4	6
Permitted Phases			

Stapley Drive Optimization

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

Existing Conditions

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8	8	7	2 6 7			2	2
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	10.0				15.0	15.0
Minimum Split (s)				46.5	46.5	46.5	16.5				26.5	26.5
Total Split (s)				37.0	37.0	37.0	30.5				32.5	32.5
Total Split (%)				37.0%	37.0%	37.0%	30.5%				32.5%	32.5%
Maximum Green (s)				30.5	30.5	30.5	24.0				26.0	26.0
Yellow Time (s)				4.5	4.5	4.5	4.5				4.5	4.5
All-Red Time (s)				2.0	2.0	2.0	2.0				2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0				0.0	0.0
Total Lost Time (s)				6.5	6.5	6.5	6.5				6.5	6.5
Lead/Lag				Lead	Lead	Lead	Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0				3.0	3.0
Recall Mode				Max	Max	Max	None				C-Max	C-Max
Walk Time (s)				7.0	7.0	7.0					7.0	7.0
Flash Dont Walk (s)				33.0	33.0	33.0					13.0	13.0
Pedestrian Calls (#/hr)				0	0	0					0	0
Act Effct Green (s)				30.5	30.5	30.5	24.0	56.5			26.0	26.0
Actuated g/C Ratio				0.30	0.30	0.30	0.24	0.56			0.26	0.26
v/c Ratio				0.69	0.71	0.57	0.71	0.32			0.48	0.64
Control Delay				38.9	38.1	21.6	51.6	6.1			36.9	17.4
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				38.9	38.1	21.6	51.6	6.1			36.9	17.4
LOS				D	D	C	D	A			D	B
Approach Delay						33.3					30.2	
Approach LOS						C					C	
Queue Length 50th (ft)				208	203	102	203	25			149	133
Queue Length 95th (ft)				317	318	196	256	69			185	237
Internal Link Dist (ft)	1204				1082			458			293	
Turn Bay Length (ft)				265		265	260					250
Base Capacity (vph)				512	492	548	823	2873			1961	780
Starvation Cap Reductn				0	0	0	0	0			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.69	0.71	0.57	0.71	0.32			0.48	0.64

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBT, Start of Yellow	
Natural Cycle:	100
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.77
Intersection Signal Delay:	28.6
Intersection Capacity Utilization	79.4%
Analysis Period (min)	15
Intersection LOS:	C
ICU Level of Service	D

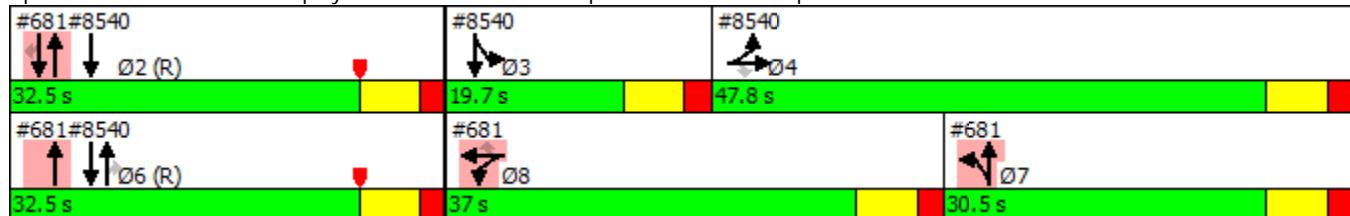
Stapley Drive Optimization

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

Existing Conditions

AM Peak Hour

Splits and Phases: 681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp



Stapley Drive Optimization
681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

Existing Conditions
AM Peak Hour

Lane Group	Ø3	Ø4	Ø6
Detector Phase			
Switch Phase			
Minimum Initial (s)	10.0	10.0	15.0
Minimum Split (s)	16.5	46.5	32.5
Total Split (s)	19.7	47.8	32.5
Total Split (%)	20%	48%	33%
Maximum Green (s)	13.2	41.3	26.0
Yellow Time (s)	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	None	Max	C-Max
Walk Time (s)		7.0	7.0
Flash Dont Walk (s)	33.0	19.0	
Pedestrian Calls (#/hr)	0	0	
Act Effect Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

Existing Conditions

AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑		↑	↑↑	↑	↑	↑↑	
Traffic Volume (vph)	114	458	115	199	890	70	197	764	113	99	892	131
Future Volume (vph)	114	458	115	199	890	70	197	764	113	99	892	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		0	188		0	195		180	195		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95
Fr _t		0.970			0.989				0.850		0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3433	0	1770	3500	0	1770	3539	1583	1770	3472	0
Flt Permitted	0.144			0.228			0.122			0.182		
Satd. Flow (perm)	268	3433	0	425	3500	0	227	3539	1583	339	3472	0
Right Turn on Red		Yes				Yes			Yes		Yes	
Satd. Flow (RTOR)		32			9				125		17	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			1788			2333	
Travel Time (s)		61.7			59.7			40.6			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	124	498	125	216	967	76	214	830	123	108	970	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	124	623	0	216	1043	0	214	830	123	108	1112	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		8	4		

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

Existing Conditions

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6		5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0		8.0	15.0		8.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.5		12.0	28.5		12.0	28.5	28.5	12.0	30.5	
Total Split (s)	12.0	34.0		14.0	36.0		16.0	39.0	39.0	13.0	36.0	
Total Split (%)	12.0%	34.0%		14.0%	36.0%		16.0%	39.0%	39.0%	13.0%	36.0%	
Maximum Green (s)	8.0	27.5		10.0	29.5		12.0	32.5	32.5	9.0	29.5	
Yellow Time (s)	3.0	4.5		3.0	4.5		3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5		0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	Max		None	C-Min	C-Min	None	C-Min	
Walk Time (s)								4.0	4.0			4.0
Flash Dont Walk (s)		23.0			18.0			18.0	18.0			20.0
Pedestrian Calls (#/hr)	0			0				0	0			0
Act Effct Green (s)	38.2	30.2		41.8	32.0		46.7	35.4	35.4	41.3	32.7	
Actuated g/C Ratio	0.38	0.30		0.42	0.32		0.47	0.35	0.35	0.41	0.33	
v/c Ratio	0.56	0.59		0.70	0.93		0.76	0.66	0.19	0.41	0.97	
Control Delay	27.4	30.8		31.6	47.4		29.5	24.2	5.8	19.8	54.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	27.4	30.8		31.6	47.4		29.5	24.2	5.8	19.8	54.0	
LOS	C	C		C	D		C	C	A	B	D	
Approach Delay		30.2			44.7			23.2				51.0
Approach LOS		C			D			C				D
Queue Length 50th (ft)	46	168		85	333		47	290	30	37	364	
Queue Length 95th (ft)	83	226		#148	#464		#169	355	52	68	#514	
Internal Link Dist (ft)		2634			2548			1708				2253
Turn Bay Length (ft)	198			188			195		180	195		
Base Capacity (vph)	222	1057		313	1126		292	1254	641	269	1146	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.56	0.59		0.69	0.93		0.73	0.66	0.19	0.40	0.97	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 38.3

Intersection LOS: D

Intersection Capacity Utilization 86.6%

ICU Level of Service E

Analysis Period (min) 15

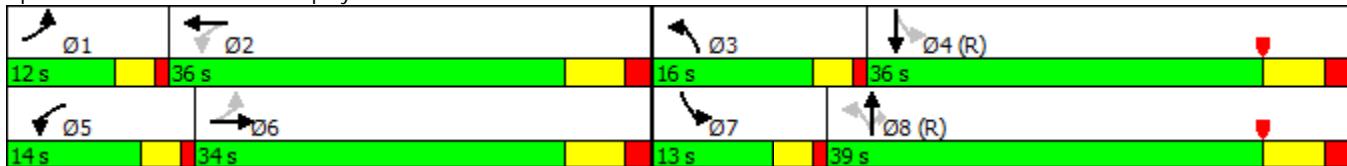
95th percentile volume exceeds capacity, queue may be longer.

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

Existing Conditions
AM Peak Hour

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

Existing Conditions

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	0	106	166	0	65	51	1001	27	46	1136	30
Future Volume (vph)	87	0	106	166	0	65	51	1001	27	46	1136	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80			140		0	80		0	90		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Fr _t			0.850			0.850		0.996			0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	0	1583	1770	0	1583	1770	3525	0	1770	3525	0
Flt Permitted	0.950			0.950			0.122			0.165		
Satd. Flow (perm)	1770	0	1583	1770	0	1583	227	3525	0	307	3525	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)			112			71						
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		497			563			419			1788	
Travel Time (s)		7.5			8.5			9.5			40.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	0	115	180	0	71	55	1088	29	50	1235	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	0	115	180	0	71	55	1117	0	50	1268	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane										Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1		1	1	2		1	2	
Detector Template	Left		Right	Left		Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20		20	20		20	20	100		20	100	
Trailing Detector (ft)	0		0	0		0	0	0		0	0	
Detector 1 Position(ft)	0		0	0		0	0	0		0	0	
Detector 1 Size(ft)	20		20	20		20	20	6		20	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Perm		Perm	Perm		Perm	Perm	NA		Perm	NA	
Protected Phases								2			2	
Permitted Phases	3		3	4		4	2			2		

Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

Existing Conditions

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	3			3	4		4	2	2	2	2	
Switch Phase												
Minimum Initial (s)	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0		20.0	20.0		20.0	20.0	20.0		20.0	20.0	
Total Split (s)	20.0		20.0	22.0		22.0	58.0	58.0		58.0	58.0	
Total Split (%)	20.0%		20.0%	22.0%		22.0%	58.0%	58.0%		58.0%	58.0%	
Maximum Green (s)	16.0		16.0	18.0		18.0	54.0	54.0		54.0	54.0	
Yellow Time (s)	3.5		3.5	3.5		3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5		0.5	0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead		Lead	Lag		Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0		3.0	3.0		3.0	3.0	3.0		3.0	3.0	
Recall Mode	None		None	C-Max		C-Max	None	None		None	None	
Walk Time (s)	5.0		5.0	5.0		5.0	5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	11.0		11.0	11.0		11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0		0	0		0	0	0		0	0	
Act Effct Green (s)	10.7		10.7	24.2		24.2	53.1	53.1		53.1	53.1	
Actuated g/C Ratio	0.11		0.11	0.24		0.24	0.53	0.53		0.53	0.53	
v/c Ratio	0.50		0.43	0.42		0.16	0.46	0.60		0.31	0.68	
Control Delay	50.7		13.4	37.2		9.4	29.9	18.2		7.5	6.5	
Queue Delay	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay	50.7		13.4	37.2		9.4	29.9	18.2		7.5	6.5	
LOS	D		B	D		A	C	B		A	A	
Approach Delay		30.2			29.3				18.8			6.5
Approach LOS		C			C			B				A
Queue Length 50th (ft)	58		2	98		0	13	310		5	72	
Queue Length 95th (ft)	105		51	174		37	m68	358		m7	m84	
Internal Link Dist (ft)		417			483			339				1708
Turn Bay Length (ft)	80			140			80			90		
Base Capacity (vph)	283		347	429		437	122	1903		165	1903	
Starvation Cap Reductn	0		0	0		0	0	0		0	0	
Spillback Cap Reductn	0		0	0		0	0	0		0	0	
Storage Cap Reductn	0		0	0		0	0	0		0	0	
Reduced v/c Ratio	0.34		0.33	0.42		0.16	0.45	0.59		0.30	0.67	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 4:WBL and 8:, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 15.0

Intersection LOS: B

Intersection Capacity Utilization 58.1%

ICU Level of Service B

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

Existing Conditions
AM Peak Hour

Splits and Phases: 8325: Stapley Dr & Hilton Avenue



Stapley Drive Optimization

8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

Existing Conditions

AM Peak Hour

	→	→	→	←	←	←	↑	↑	↓	↓	←	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	0	0	0	0	4	1	1	1	1
Traffic Volume (vph)	342	0	531	0	0	0	0	1080	306	323	1073	0
Future Volume (vph)	342	0	531	0	0	0	0	1080	306	323	1073	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	260		260	0		0	260		260	265		0
Storage Lanes	1		1	0		0	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.91	0.95	1.00	1.00	1.00	1.00	0.81	1.00	0.97	0.91	1.00
Fr _t			0.870	0.850					0.850			
Flt Protected	0.950	0.993								0.950		
Satd. Flow (prot)	1681	1464	1504	0	0	0	0	7544	1583	3433	5085	0
Flt Permitted	0.950	0.993								0.950		
Satd. Flow (perm)	1681	1464	1504	0	0	0	0	7544	1583	3433	5085	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		109	109							333		
Link Speed (mph)		30		30			30			30		
Link Distance (ft)		1281		1130			492			538		
Travel Time (s)		29.1		25.7			11.2			12.2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	372	0	577	0	0	0	0	1174	333	351	1166	0
Shared Lane Traffic (%)	11%		47%									
Lane Group Flow (vph)	331	312	306	0	0	0	0	1174	333	351	1166	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12		12			24			24		
Link Offset(ft)		0		0			0			0		
Crosswalk Width(ft)		16		16			16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1				2	1	1	2		
Detector Template	Left	Thru	Right				Thru	Right	Left	Thru		
Leading Detector (ft)	20	100	20				100	20	20	100		
Trailing Detector (ft)	0	0	0				0	0	0	0		
Detector 1 Position(ft)	0	0	0				0	0	0	0		
Detector 1 Size(ft)	20	6	20				6	20	20	6		
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0		
Detector 1 Queue (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0		
Detector 1 Delay (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0		
Detector 2 Position(ft)		94				94			94			
Detector 2 Size(ft)		6				6			6			
Detector 2 Type		Cl+Ex				Cl+Ex			Cl+Ex			
Detector 2 Channel												
Detector 2 Extend (s)		0.0				0.0			0.0			
Turn Type	Split	NA	Perm				NA	Perm	Prot	NA		
Protected Phases	4	4					6		3	2 3 6		
Permitted Phases		4					6		6			

Stapley Drive Optimization
8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

Existing Conditions
AM Peak Hour

Lane Group	Ø2	Ø7	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	2	7	8
Permitted Phases			

Stapley Drive Optimization

8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

Existing Conditions

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4					6	6	3	2	3 6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0					15.0	15.0	10.0		
Minimum Split (s)	46.5	46.5	46.5					32.5	32.5	16.5		
Total Split (s)	47.8	47.8	47.8					32.5	32.5	19.7		
Total Split (%)	47.8%	47.8%	47.8%					32.5%	32.5%	19.7%		
Maximum Green (s)	41.3	41.3	41.3					26.0	26.0	13.2		
Yellow Time (s)	4.5	4.5	4.5					4.5	4.5	4.5		
All-Red Time (s)	2.0	2.0	2.0					2.0	2.0	2.0		
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5					6.5	6.5	6.5		
Lead/Lag	Lag	Lag	Lag								Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0		
Recall Mode	Max	Max	Max					C-Max	C-Max	None		
Walk Time (s)	7.0	7.0	7.0					7.0	7.0			
Flash Dont Walk (s)	33.0	33.0	33.0					19.0	19.0			
Pedestrian Calls (#/hr)	0	0	0					0	0			
Act Effct Green (s)	41.3	41.3	41.3					26.0	26.0	13.2	45.7	
Actuated g/C Ratio	0.41	0.41	0.41					0.26	0.26	0.13	0.46	
v/c Ratio	0.48	0.47	0.45					0.60	0.51	0.77	0.50	
Control Delay	24.3	16.1	15.6					33.9	6.3	51.7	18.4	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	24.3	16.1	15.6					33.9	6.3	51.7	18.4	
LOS	C	B	B					C	A	D	B	
Approach Delay		18.8						27.8			26.1	
Approach LOS		B						C			C	
Queue Length 50th (ft)	158	97	89					162	0	121	109	
Queue Length 95th (ft)	244	181	167					193	66	#181	128	
Internal Link Dist (ft)		1201		1050				412			458	
Turn Bay Length (ft)	260		260					260	265			
Base Capacity (vph)	694	668	685					1961	658	453	2323	
Starvation Cap Reductn	0	0	0					0	0	0	0	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.48	0.47	0.45					0.60	0.51	0.77	0.50	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 25.0

Intersection LOS: C

Intersection Capacity Utilization 79.4%

ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Stapley Drive Optimization
8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

Existing Conditions
AM Peak Hour

Lane Group	Ø2	Ø7	Ø8
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	10.0	10.0
Minimum Split (s)	26.5	16.5	46.5
Total Split (s)	32.5	30.5	37.0
Total Split (%)	33%	31%	37%
Maximum Green (s)	26.0	24.0	30.5
Yellow Time (s)	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	C-Max	None	Max
Walk Time (s)	7.0		7.0
Flash Dont Walk (s)	13.0		33.0
Pedestrian Calls (#/hr)	0		0
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Stapley Drive Optimization

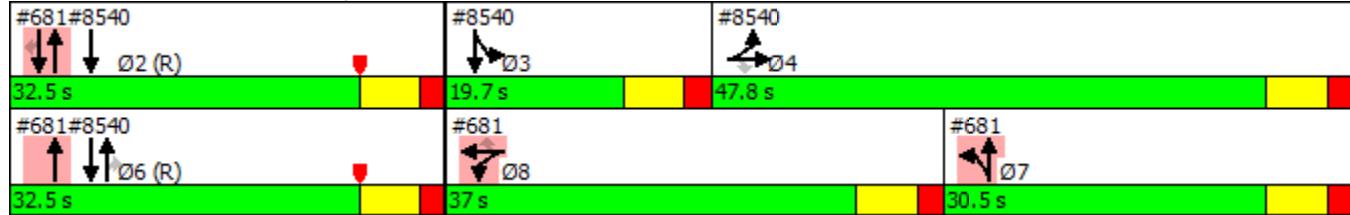
8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

Existing Conditions

AM Peak Hour

Queue shown is maximum after two cycles.

Splits and Phases: 8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp



Stapley Drive Optimization

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

Existing Conditions

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	364	3	394	548	1239	0	0	993	489
Future Volume (vph)	0	0	0	364	3	394	548	1239	0	0	993	489
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	265		265	260		0	250		250
Storage Lanes	0		0	1		1	2		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	0.97	0.91	1.00	1.00	0.81	1.00
Fr _t					0.912	0.850						0.850
Flt Protected					0.950	0.980		0.950				
Satd. Flow (prot)	0	0	0	1681	1515	1504	3433	5085	0	0	7544	1583
Flt Permitted					0.950	0.980		0.950				
Satd. Flow (perm)	0	0	0	1681	1515	1504	3433	5085	0	0	7544	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					50	99						530
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1284			1162			538			373	
Travel Time (s)		29.2			26.4			12.2			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	396	3	428	596	1347	0	0	1079	532
Shared Lane Traffic (%)				28%		38%						
Lane Group Flow (vph)	0	0	0	285	277	265	596	1347	0	0	1079	532
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2	1	1	2			2	1
Detector Template				Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)				20	100	20	20	100			100	20
Trailing Detector (ft)				0	0	0	0	0			0	0
Detector 1 Position(ft)				0	0	0	0	0			0	0
Detector 1 Size(ft)				20	6	20	20	6			6	20
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94		94				94	
Detector 2 Size(ft)					6		6				6	
Detector 2 Type					Cl+Ex		Cl+Ex				Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0		0.0				0.0	
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				8	8		7	2 6 7			2	
Permitted Phases					8							2

Stapley Drive Optimization
681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

Existing Conditions
PM Peak Hour

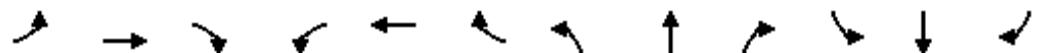
Lane Group	Ø3	Ø4	Ø6
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Fr _t			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	3	4	6
Permitted Phases			

Stapley Drive Optimization

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

Existing Conditions

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8	8	7	2 6 7			2	2
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	10.0				15.0	15.0
Minimum Split (s)				46.5	46.5	46.5	16.5				26.5	26.5
Total Split (s)				39.0	39.0	39.0	36.7				34.3	34.3
Total Split (%)				35.5%	35.5%	35.5%	33.4%				31.2%	31.2%
Maximum Green (s)				32.5	32.5	32.5	30.2				27.8	27.8
Yellow Time (s)				4.5	4.5	4.5	4.5				4.5	4.5
All-Red Time (s)				2.0	2.0	2.0	2.0				2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0				0.0	0.0
Total Lost Time (s)				6.5	6.5	6.5	6.5				6.5	6.5
Lead/Lag				Lead	Lead	Lead	Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0				3.0	3.0
Recall Mode				Max	Max	Max	None				C-Max	C-Max
Walk Time (s)				7.0	7.0	7.0					7.0	7.0
Flash Dont Walk (s)				33.0	33.0	33.0					13.0	13.0
Pedestrian Calls (#/hr)				0	0	0					0	0
Act Effect Green (s)				32.5	32.5	32.5	30.2	64.5			27.8	27.8
Actuated g/C Ratio				0.30	0.30	0.30	0.27	0.59			0.25	0.25
v/c Ratio				0.57	0.57	0.52	0.63	0.45			0.57	0.67
Control Delay				38.4	32.2	23.8	48.9	9.7			17.9	12.2
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				38.4	32.2	23.8	48.9	9.7			17.9	12.2
LOS				D	C	C	D	A			B	B
Approach Delay						31.6			21.7		16.0	
Approach LOS						C			C		B	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 21.5

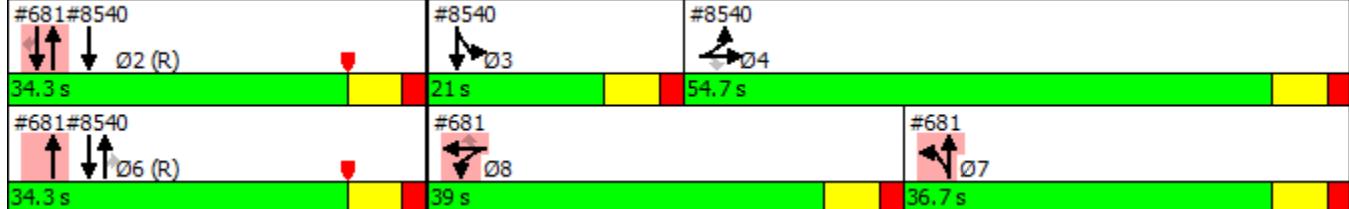
Intersection LOS: C

Intersection Capacity Utilization 84.0%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp



Stapley Drive Optimization
681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

Existing Conditions
PM Peak Hour

Lane Group	Ø3	Ø4	Ø6
Detector Phase			
Switch Phase			
Minimum Initial (s)	10.0	10.0	15.0
Minimum Split (s)	16.5	46.5	32.5
Total Split (s)	21.0	54.7	34.3
Total Split (%)	19%	50%	31%
Maximum Green (s)	14.5	48.2	27.8
Yellow Time (s)	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	None	Max	C-Max
Walk Time (s)		7.0	7.0
Flash Dont Walk (s)	33.0	19.0	
Pedestrian Calls (#/hr)	0	0	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

Existing Conditions

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	693	133	182	544	96	194	1025	201	170	1038	101
Future Volume (vph)	165	693	133	182	544	96	194	1025	201	170	1038	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		0	188		0	195		180	195		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95
Fr _t		0.976			0.978				0.850		0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3454	0	1770	3461	0	1770	3539	1583	1770	3493	0
Flt Permitted	0.158			0.143			0.098			0.106		
Satd. Flow (perm)	294	3454	0	266	3461	0	183	3539	1583	197	3493	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			18				164		10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			1788			2333	
Travel Time (s)		61.7			59.7			40.6			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	179	753	145	198	591	104	211	1114	218	185	1128	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	179	898	0	198	695	0	211	1114	218	185	1238	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		8	4		

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

Existing Conditions

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6		5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0		8.0	15.0		8.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.5		12.0	28.5		12.0	28.5	28.5	12.0	30.5	
Total Split (s)	15.0	35.0		14.0	34.0		19.0	47.0	47.0	14.0	42.0	
Total Split (%)	13.6%	31.8%		12.7%	30.9%		17.3%	42.7%	42.7%	12.7%	38.2%	
Maximum Green (s)	11.0	28.5		10.0	27.5		15.0	40.5	40.5	10.0	35.5	
Yellow Time (s)	3.0	4.5		3.0	4.5		3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5		0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	Max		None	C-Max	C-Max	None	C-Max	
Walk Time (s)												4.0
Flash Dont Walk (s)												20.0
Pedestrian Calls (#/hr)	0			0			0	0	0			0
Act Effect Green (s)	41.6	31.0		40.4	30.4		55.5	43.2	43.2	50.1	40.3	
Actuated g/C Ratio	0.38	0.28		0.37	0.28		0.50	0.39	0.39	0.46	0.37	
v/c Ratio	0.71	0.91		0.85	0.72		0.76	0.80	0.30	0.81	0.96	
Control Delay	38.2	51.6		55.0	40.0		59.4	21.4	5.5	49.6	52.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	38.2	51.6		55.0	40.0		59.4	21.4	5.5	49.6	52.7	
LOS	D	D		D	D		E	C	A	D	D	
Approach Delay												52.3
Approach LOS				D				C			D	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 41.3

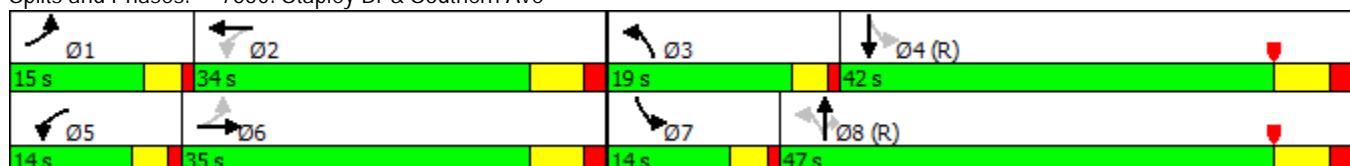
Intersection LOS: D

Intersection Capacity Utilization 89.5%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

Existing Conditions

PM Peak Hour

Lane Group	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	0	81	71	0	27	53	1337	67	25	1381	37
Future Volume (vph)	47	0	81	71	0	27	53	1337	67	25	1381	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		0	140		0	80		0	90		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25		25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Fr _t			0.850			0.850		0.993				0.996
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	0	1583	1770	0	1583	1770	3514	0	1770	3525	0
Flt Permitted	0.950			0.950			0.107			0.110		
Satd. Flow (perm)	1770	0	1583	1770	0	1583	199	3514	0	205	3525	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			88			50		10				5
Link Speed (mph)			45			45		30				30
Link Distance (ft)			497			563		419				1788
Travel Time (s)			7.5			8.5		9.5				40.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	0	88	77	0	29	58	1453	73	27	1501	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	0	88	77	0	29	58	1526	0	27	1541	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)			12			12		12				0
Link Offset(ft)			0			0		0				0
Crosswalk Width(ft)			16			16		16				16
Two way Left Turn Lane												Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1		1	1	2		1	2	
Detector Template	Left		Right	Left		Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20		20	20		20	20	100		20	100	
Trailing Detector (ft)	0		0	0		0	0	0		0	0	
Detector 1 Position(ft)	0		0	0		0	0	0		0	0	
Detector 1 Size(ft)	20		20	20		20	20	6		20	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)								94				94
Detector 2 Size(ft)								6				6
Detector 2 Type								Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)								0.0				0.0
Turn Type	Perm		Perm	Perm		Perm	Perm	NA		Perm	NA	
Protected Phases								2				2
Permitted Phases	3		3	4		4	2			2		

Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

Existing Conditions
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	3			3	4		4	2	2	2	2	
Switch Phase												
Minimum Initial (s)	4.0			4.0			4.0	4.0	4.0	4.0		4.0
Minimum Split (s)	15.0			15.0	15.0		15.0	20.0	20.0	20.0		20.0
Total Split (s)	17.0			17.0	15.0		15.0	78.0	78.0	78.0		78.0
Total Split (%)	15.5%			15.5%	13.6%		13.6%	70.9%	70.9%	70.9%		70.9%
Maximum Green (s)	13.0			13.0	11.0		11.0	74.0	74.0	74.0		74.0
Yellow Time (s)	3.5			3.5	3.5		3.5	3.5	3.5	3.5		3.5
All-Red Time (s)	0.5			0.5	0.5		0.5	0.5	0.5	0.5		0.5
Lost Time Adjust (s)	0.0			0.0	0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.0			4.0	4.0		4.0	4.0	4.0	4.0		4.0
Lead/Lag	Lead			Lag			Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0	3.0	3.0		3.0
Recall Mode	None			None	Max		Max	C-Max	C-Max	C-Max		C-Max
Act Effect Green (s)	8.6			8.6	17.3		17.3	74.0	74.0	74.0		74.0
Actuated g/C Ratio	0.08			0.08	0.16		0.16	0.67	0.67	0.67		0.67
v/c Ratio	0.37			0.43	0.28		0.10	0.44	0.64	0.20		0.65
Control Delay	55.0			16.7	46.5		5.8	28.6	22.1	18.6		27.6
Queue Delay	0.0			0.0	0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	55.0			16.7	46.5		5.8	28.6	22.1	18.6		27.6
LOS	D			B	D		A	C	C	B		C
Approach Delay		30.8				35.3			22.3			27.4
Approach LOS		C				D			C			C

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 25.4

Intersection LOS: C

Intersection Capacity Utilization 58.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 8325: Stapley Dr & Hilton Avenue



Stapley Drive Optimization

8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

Existing Conditions

PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1					4	1	1	1	1
Traffic Volume (vph)	502	6	875	0	0	0	0	1280	574	323	1002	0
Future Volume (vph)	502	6	875	0	0	0	0	1280	574	323	1002	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	260		260	0			0	260		260	265	0
Storage Lanes	1		1	0			0	2		1	2	0
Taper Length (ft)	25			25				25			25	
Lane Util. Factor	0.95	0.91	0.95	1.00	1.00	1.00	1.00	0.81	1.00	0.97	0.91	1.00
Fr _t			0.868	0.850						0.850		
Flt Protected	0.950	0.995								0.950		
Satd. Flow (prot)	1681	1464	1504	0	0	0	0	7544	1583	3433	5085	0
Flt Permitted	0.950	0.995								0.950		
Satd. Flow (perm)	1681	1464	1504	0	0	0	0	7544	1583	3433	5085	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40	99							624		
Link Speed (mph)		30		30			30				30	
Link Distance (ft)		1281		1130			492				538	
Travel Time (s)		29.1		25.7			11.2				12.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	546	7	951	0	0	0	0	1391	624	351	1089	0
Shared Lane Traffic (%)	10%		47%									
Lane Group Flow (vph)	491	509	504	0	0	0	0	1391	624	351	1089	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12		12			24			24		
Link Offset(ft)		0		0			0			0		
Crosswalk Width(ft)		16		16			16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1					2	1	1	2	
Detector Template	Left	Thru	Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20					100	20	20	100	
Trailing Detector (ft)	0	0	0					0	0	0	0	
Detector 1 Position(ft)	0	0	0					0	0	0	0	
Detector 1 Size(ft)	20	6	20					6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	4	4						6		3	2 3 6	
Permitted Phases		4						6				

Stapley Drive Optimization
8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

Existing Conditions
PM Peak Hour

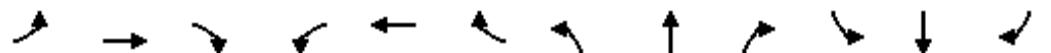
Lane Group	Ø2	Ø7	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	2	7	8
Permitted Phases			

Stapley Drive Optimization

8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

Existing Conditions

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4					6	6	3	2	3 6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0					15.0	15.0	10.0		
Minimum Split (s)	46.5	46.5	46.5					32.5	32.5	16.5		
Total Split (s)	54.7	54.7	54.7					34.3	34.3	21.0		
Total Split (%)	49.7%	49.7%	49.7%					31.2%	31.2%	19.1%		
Maximum Green (s)	48.2	48.2	48.2					27.8	27.8	14.5		
Yellow Time (s)	4.5	4.5	4.5					4.5	4.5	4.5		
All-Red Time (s)	2.0	2.0	2.0					2.0	2.0	2.0		
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5					6.5	6.5	6.5		
Lead/Lag	Lag	Lag	Lag								Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0		
Recall Mode	Max	Max	Max					C-Max	C-Max	None		
Walk Time (s)	7.0	7.0	7.0					7.0	7.0			
Flash Dont Walk (s)	33.0	33.0	33.0					19.0	19.0			
Pedestrian Calls (#/hr)	0	0	0					0	0			
Act Effct Green (s)	48.2	48.2	48.2					27.8	27.8	14.5	48.8	
Actuated g/C Ratio	0.44	0.44	0.44					0.25	0.25	0.13	0.44	
v/c Ratio	0.67	0.77	0.71					0.73	0.72	0.78	0.48	
Control Delay	30.0	33.2	26.3					40.3	8.2	45.8	13.3	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	30.0	33.2	26.3					40.3	8.2	45.8	13.3	
LOS	C	C	C					D	A	D	B	
Approach Delay		29.8						30.4			21.2	
Approach LOS		C						C			C	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 27.5

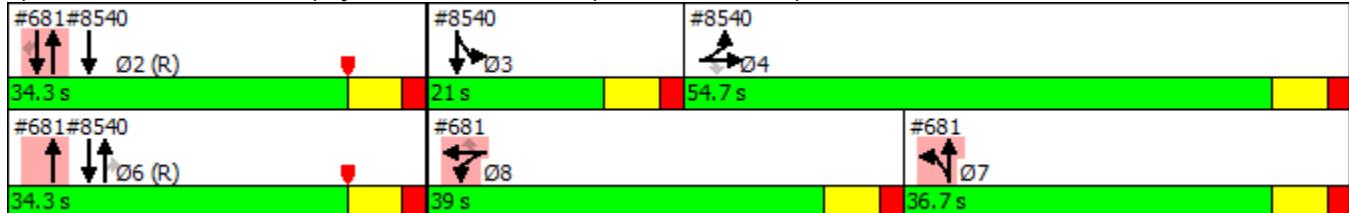
Intersection LOS: C

Intersection Capacity Utilization 84.0%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp



Stapley Drive Optimization
8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

Existing Conditions
PM Peak Hour

Lane Group	Ø2	Ø7	Ø8
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	10.0	10.0
Minimum Split (s)	26.5	16.5	46.5
Total Split (s)	34.3	36.7	39.0
Total Split (%)	31%	33%	35%
Maximum Green (s)	27.8	30.2	32.5
Yellow Time (s)	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	C-Max	None	Max
Walk Time (s)	7.0		7.0
Flash Dont Walk (s)	13.0		33.0
Pedestrian Calls (#/hr)	0		0
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Stapley Drive Optimization

2020

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

AM Peak Hour

	→	→	→	←	←	↑	↑	↓	↓	←	→	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↑	↑	↑	↑↑	↑↑↑		↑↑↑↑	↑↑↑↑	↑
Traffic Volume (vph)	0	0	0	569	11	383	556	868	0	0	894	473
Future Volume (vph)	0	0	0	569	11	383	556	868	0	0	894	473
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	265		265	260		0	250		250
Storage Lanes	0		0	1		1	2		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	0.97	0.91	1.00	1.00	0.81	1.00
Fr _t					0.964	0.850						0.850
Flt Protected					0.950	0.965		0.950				
Satd. Flow (prot)	0	0	0	1681	1577	1504	3433	5085	0	0	7544	1583
Flt Permitted					0.950	0.965		0.950				
Satd. Flow (perm)	0	0	0	1681	1577	1504	3433	5085	0	0	7544	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					17	120						514
Link Speed (mph)		30			30		30				30	
Link Distance (ft)		1284			1162		538				373	
Travel Time (s)		29.2			26.4		12.2				8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	618	12	416	604	943	0	0	972	514
Shared Lane Traffic (%)				42%		21%						
Lane Group Flow (vph)	0	0	0	358	359	329	604	943	0	0	972	514
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12		24				24	
Link Offset(ft)		0			0		0				0	
Crosswalk Width(ft)		16			16		16				16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2	1	1	2			2	1
Detector Template				Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)				20	100	20	20	100			100	20
Trailing Detector (ft)				0	0	0	0	0			0	0
Detector 1 Position(ft)				0	0	0	0	0			0	0
Detector 1 Size(ft)				20	6	20	20	6			6	20
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94		94				94	
Detector 2 Size(ft)					6		6				6	
Detector 2 Type					Cl+Ex		Cl+Ex				Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0		0.0				0.0	
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				8	8		7	2 6 7			2	
Permitted Phases					8							2

Lane Group	Ø3	Ø4	Ø6
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	3	4	6
Permitted Phases			

Stapley Drive Optimization

2020

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

AM Peak Hour

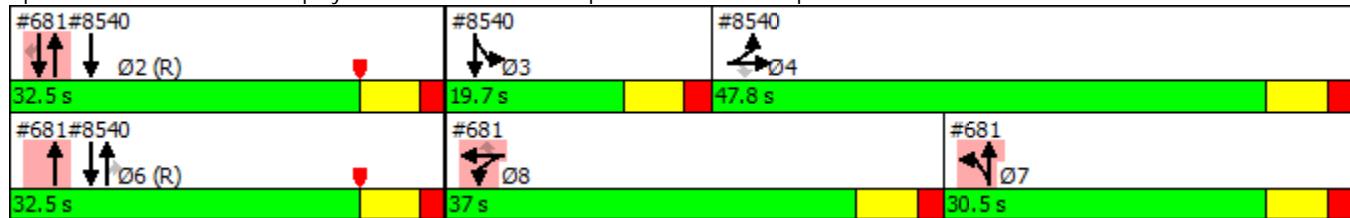


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8	8	7	2 6 7			2	2
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	10.0				15.0	15.0
Minimum Split (s)				46.5	46.5	46.5	16.5				26.5	26.5
Total Split (s)				37.0	37.0	37.0	30.5				32.5	32.5
Total Split (%)				37.0%	37.0%	37.0%	30.5%				32.5%	32.5%
Maximum Green (s)				30.5	30.5	30.5	24.0				26.0	26.0
Yellow Time (s)				4.5	4.5	4.5	4.5				4.5	4.5
All-Red Time (s)				2.0	2.0	2.0	2.0				2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0				0.0	0.0
Total Lost Time (s)				6.5	6.5	6.5	6.5				6.5	6.5
Lead/Lag				Lead	Lead	Lead	Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0				3.0	3.0
Recall Mode				Max	Max	Max	None				C-Max	C-Max
Walk Time (s)				7.0	7.0	7.0					7.0	7.0
Flash Dont Walk (s)				33.0	33.0	33.0					13.0	13.0
Pedestrian Calls (#/hr)				0	0	0					0	0
Act Effct Green (s)				30.5	30.5	30.5	24.0	56.5			26.0	26.0
Actuated g/C Ratio				0.30	0.30	0.30	0.24	0.56			0.26	0.26
v/c Ratio				0.70	0.73	0.61	0.73	0.33			0.50	0.65
Control Delay				39.2	39.6	23.9	52.0	6.6			38.0	18.6
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				39.2	39.6	23.9	52.0	6.6			38.0	18.6
LOS				D	D	C	D	A			D	B
Approach Delay						34.5		24.3			31.3	
Approach LOS						C		C			C	
Queue Length 50th (ft)				211	214	117	209	30			153	158
Queue Length 95th (ft)				322	332	216	262	76			191	240
Internal Link Dist (ft)	1204				1082			458			293	
Turn Bay Length (ft)				265		265	260					250
Base Capacity (vph)				512	492	542	823	2873			1961	791
Starvation Cap Reductn				0	0	0	0	0			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.70	0.73	0.61	0.73	0.33			0.50	0.65

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset: 0 (0%), Referenced to phase 2:NSSB and 6:NBT, Start of Yellow	
Natural Cycle:	100
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.80
Intersection Signal Delay:	29.5
Intersection Capacity Utilization	81.3%
Analysis Period (min)	15
Intersection LOS:	C
ICU Level of Service	D

Splits and Phases: 681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp



Lane Group	Ø3	Ø4	Ø6
Detector Phase			
Switch Phase			
Minimum Initial (s)	10.0	10.0	15.0
Minimum Split (s)	16.5	46.5	32.5
Total Split (s)	19.7	47.8	32.5
Total Split (%)	20%	48%	33%
Maximum Green (s)	13.2	41.3	26.0
Yellow Time (s)	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	None	Max	C-Max
Walk Time (s)		7.0	7.0
Flash Dont Walk (s)	33.0	19.0	
Pedestrian Calls (#/hr)	0	0	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2020

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	472	118	205	917	72	203	787	116	102	919	135
Future Volume (vph)	117	472	118	205	917	72	203	787	116	102	919	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		0	188		0	195		180	195		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.91	0.91
Fr _t		0.970			0.989				0.850		0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3433	0	1770	3500	0	1770	3539	1583	1770	4989	0
Flt Permitted	0.137			0.227			0.129			0.144		
Satd. Flow (perm)	255	3433	0	423	3500	0	240	3539	1583	268	4989	0
Right Turn on Red			Yes				Yes			Yes		Yes
Satd. Flow (RTOR)		31			8				126		29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			359			2333	
Travel Time (s)		61.7			59.7			8.2			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	127	513	128	223	997	78	221	855	126	111	999	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	127	641	0	223	1075	0	221	855	126	111	1146	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		8	4		

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2020
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6		5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0		8.0	15.0		8.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.5		12.0	28.5		12.0	28.5	28.5	12.0	30.5	
Total Split (s)	12.0	34.0		14.0	36.0		14.0	39.0	39.0	13.0	38.0	
Total Split (%)	12.0%	34.0%		14.0%	36.0%		14.0%	39.0%	39.0%	13.0%	38.0%	
Maximum Green (s)	8.0	27.5		10.0	29.5		10.0	32.5	32.5	9.0	31.5	
Yellow Time (s)	3.0	4.5		3.0	4.5		3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5		0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	Max		None	C-Min	C-Min	None	C-Min	
Walk Time (s)								4.0	4.0			4.0
Flash Dont Walk (s)		23.0				18.0		18.0	18.0			20.0
Pedestrian Calls (#/hr)		0				0		0	0			0
Act Effct Green (s)	39.6	31.5		43.9	33.7		43.7	33.7	33.7	40.8	32.3	
Actuated g/C Ratio	0.40	0.32		0.44	0.34		0.44	0.34	0.34	0.41	0.32	
v/c Ratio	0.57	0.58		0.69	0.91		0.86	0.72	0.20	0.47	0.70	
Control Delay	27.6	30.2		30.7	44.5		43.2	25.7	5.7	21.8	31.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	27.6	30.2		30.7	44.5		43.2	25.7	5.7	21.8	31.4	
LOS	C	C		C	D		D	C	A	C	C	
Approach Delay		29.8			42.1			26.8			30.5	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)	48	174		89	348		47	299	29	38	220	
Queue Length 95th (ft)	85	234		#158	#488		#199	365	m50	70	270	
Internal Link Dist (ft)		2634			2548			279			2253	
Turn Bay Length (ft)	198			188			195		180	195		
Base Capacity (vph)	223	1103		326	1183		258	1239	635	245	1715	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.57	0.58		0.68	0.91		0.86	0.69	0.20	0.45	0.67	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 32.7

Intersection LOS: C

Intersection Capacity Utilization 79.7%

ICU Level of Service D

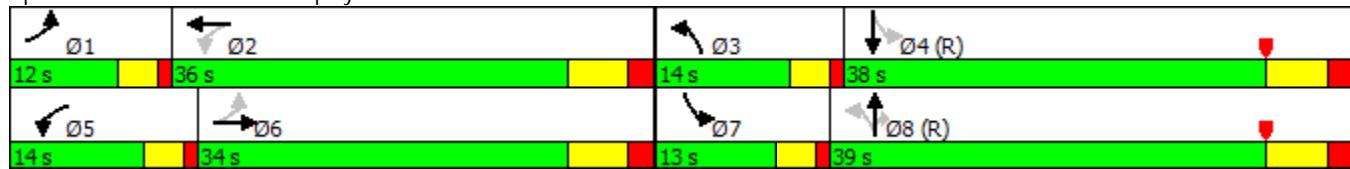
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

2020

AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑		↑	↑		↑	↑	↑↓		↑	↑↓	
Traffic Volume (vph)	87	0	106	166	0	65	51	1031	27	46	1170	30
Future Volume (vph)	87	0	106	166	0	65	51	1031	27	46	1170	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80			140		0	80		0	90		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Fr _t			0.850			0.850		0.996			0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	0	1583	1770	0	1583	1770	3525	0	1770	3525	0
Flt Permitted	0.950			0.950			0.114			0.157		
Satd. Flow (perm)	1770	0	1583	1770	0	1583	212	3525	0	292	3525	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)			109			71						
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		497			563			419			1429	
Travel Time (s)		7.5			8.5			9.5			32.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	0	115	180	0	71	55	1121	29	50	1272	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	0	115	180	0	71	55	1150	0	50	1305	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1		1	1	2		1	2	
Detector Template	Left		Right	Left		Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20		20	20		20	20	100		20	100	
Trailing Detector (ft)	0		0	0		0	0	0		0	0	
Detector 1 Position(ft)	0		0	0		0	0	0		0	0	
Detector 1 Size(ft)	20		20	20		20	20	6		20	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Perm		Perm	Perm		Perm	Perm	NA		Perm	NA	
Protected Phases								2			2	
Permitted Phases	3		3	4		4	2			2		

Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

2020

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	3			3	4		4	2	2	2	2	
Switch Phase												
Minimum Initial (s)	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0		20.0	20.0		20.0	20.0	20.0		20.0	20.0	
Total Split (s)	20.0		20.0	22.0		22.0	58.0	58.0		58.0	58.0	
Total Split (%)	20.0%		20.0%	22.0%		22.0%	58.0%	58.0%		58.0%	58.0%	
Maximum Green (s)	16.0		16.0	18.0		18.0	54.0	54.0		54.0	54.0	
Yellow Time (s)	3.5		3.5	3.5		3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5		0.5	0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead		Lead	Lag		Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0		3.0	3.0		3.0	3.0	3.0		3.0	3.0	
Recall Mode	None		None	C-Max		C-Max	None	None		None	None	
Walk Time (s)	5.0		5.0	5.0		5.0	5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	11.0		11.0	11.0		11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0		0	0		0	0	0		0	0	
Act Effct Green (s)	10.7		10.7	23.9		23.9	53.5	53.5		53.5	53.5	
Actuated g/C Ratio	0.11		0.11	0.24		0.24	0.54	0.54		0.54	0.54	
v/c Ratio	0.50		0.43	0.43		0.16	0.49	0.61		0.32	0.69	
Control Delay	50.7		14.1	37.4		9.4	33.0	18.5		9.5	9.2	
Queue Delay	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay	50.7		14.1	37.4		9.4	33.0	18.5		9.5	9.2	
LOS	D		B	D		A	C	B		A	A	
Approach Delay		30.7			29.5				19.1			9.2
Approach LOS		C			C			B				A
Queue Length 50th (ft)	58		4	98		0	23	316		5	75	
Queue Length 95th (ft)	105		53	174		37	m70	372		m9	94	
Internal Link Dist (ft)		417			483			339				1349
Turn Bay Length (ft)	80			140			80			90		
Base Capacity (vph)	283		344	422		431	114	1903		157	1903	
Starvation Cap Reductn	0		0	0		0	0	0		0	0	
Spillback Cap Reductn	0		0	0		0	0	0		0	0	
Storage Cap Reductn	0		0	0		0	0	0		0	0	
Reduced v/c Ratio	0.34		0.33	0.43		0.16	0.48	0.60		0.32	0.69	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 4:WBL and 8:, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 16.3

Intersection LOS: B

Intersection Capacity Utilization 59.1%

ICU Level of Service B

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8325: Stapley Dr & Hilton Avenue



Stapley Drive Optimization
8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

2020
AM Peak Hour

	→	→	→	←	←	↑	↑	↓	↓	←	→	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	0	0	0	0	1113	315	333	1106	0
Traffic Volume (vph)	352	0	547	0	0	0	0	1113	315	333	1106	0
Future Volume (vph)	352	0	547	0	0	0	0	1113	315	333	1106	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	260		260	0		0	260		260	265		0
Storage Lanes	1		1	0		0	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.91	0.95	1.00	1.00	1.00	1.00	0.81	1.00	0.97	0.91	1.00
Fr _t			0.870	0.850					0.850			
Flt Protected	0.950	0.994								0.950		
Satd. Flow (prot)	1681	1466	1504	0	0	0	0	7544	1583	3433	5085	0
Flt Permitted	0.950	0.994								0.950		
Satd. Flow (perm)	1681	1466	1504	0	0	0	0	7544	1583	3433	5085	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		109	109							342		
Link Speed (mph)		30		30			30				30	
Link Distance (ft)		1281		1130			492				538	
Travel Time (s)		29.1		25.7			11.2				12.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	383	0	595	0	0	0	0	1210	342	362	1202	0
Shared Lane Traffic (%)	11%		47%									
Lane Group Flow (vph)	341	322	315	0	0	0	0	1210	342	362	1202	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12		12			24				24	
Link Offset(ft)		0		0			0				0	
Crosswalk Width(ft)		16		16			16				16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1				2	1	1	2		
Detector Template	Left	Thru	Right				Thru	Right	Left	Thru		
Leading Detector (ft)	20	100	20				100	20	20	100		
Trailing Detector (ft)	0	0	0				0	0	0	0		
Detector 1 Position(ft)	0	0	0				0	0	0	0		
Detector 1 Size(ft)	20	6	20				6	20	20	6		
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0		
Detector 1 Queue (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0		
Detector 1 Delay (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0		
Detector 2 Position(ft)		94				94			94			
Detector 2 Size(ft)		6				6			6			
Detector 2 Type		Cl+Ex				Cl+Ex			Cl+Ex			
Detector 2 Channel												
Detector 2 Extend (s)		0.0					0.0			0.0		
Turn Type	Split	NA	Perm				NA	Perm	Prot	NA		
Protected Phases	4	4					6		3	2 3 6		
Permitted Phases		4					6		6			

Lane Group	Ø2	Ø7	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	2	7	8
Permitted Phases			

Stapley Drive Optimization
8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

2020
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4					6	6	3	2	3 6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0					15.0	15.0	10.0		
Minimum Split (s)	46.5	46.5	46.5					32.5	32.5	16.5		
Total Split (s)	47.8	47.8	47.8					32.5	32.5	19.7		
Total Split (%)	47.8%	47.8%	47.8%					32.5%	32.5%	19.7%		
Maximum Green (s)	41.3	41.3	41.3					26.0	26.0	13.2		
Yellow Time (s)	4.5	4.5	4.5					4.5	4.5	4.5		
All-Red Time (s)	2.0	2.0	2.0					2.0	2.0	2.0		
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5					6.5	6.5	6.5		
Lead/Lag	Lag	Lag	Lag								Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0		
Recall Mode	Max	Max	Max					C-Max	C-Max	None		
Walk Time (s)	7.0	7.0	7.0					7.0	7.0			
Flash Dont Walk (s)	33.0	33.0	33.0					19.0	19.0			
Pedestrian Calls (#/hr)	0	0	0					0	0			
Act Effct Green (s)	41.3	41.3	41.3					26.0	26.0	13.2	45.7	
Actuated g/C Ratio	0.41	0.41	0.41					0.26	0.26	0.13	0.46	
v/c Ratio	0.49	0.48	0.46					0.62	0.52	0.80	0.52	
Control Delay	24.6	16.6	16.0					34.2	6.4	53.0	18.4	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	24.6	16.6	16.0					34.2	6.4	53.0	18.4	
LOS	C	B	B					C	A	D	B	
Approach Delay		19.2						28.1			26.4	
Approach LOS		B						C			C	
Queue Length 50th (ft)	165	103	94					168	0	125	112	
Queue Length 95th (ft)	252	190	174					200	68	#190	132	
Internal Link Dist (ft)		1201		1050				412			458	
Turn Bay Length (ft)	260		260					260	265			
Base Capacity (vph)	694	669	685					1961	664	453	2323	
Starvation Cap Reductn	0	0	0					0	0	0	0	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.49	0.48	0.46					0.62	0.52	0.80	0.52	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 25.3

Intersection LOS: C

Intersection Capacity Utilization 81.3%

ICU Level of Service D

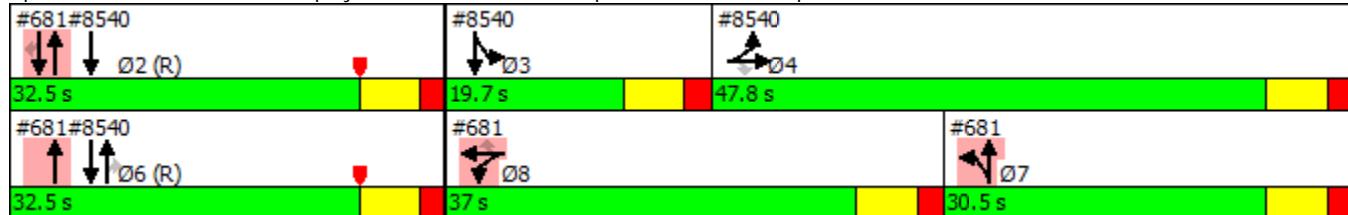
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Lane Group	Ø2	Ø7	Ø8
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	10.0	10.0
Minimum Split (s)	26.5	16.5	46.5
Total Split (s)	32.5	30.5	37.0
Total Split (%)	33%	31%	37%
Maximum Green (s)	26.0	24.0	30.5
Yellow Time (s)	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	C-Max	None	Max
Walk Time (s)	7.0		7.0
Flash Dont Walk (s)	13.0		33.0
Pedestrian Calls (#/hr)	0		0
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Queue shown is maximum after two cycles.

Splits and Phases: 8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp



Stapley Drive Optimization

2020

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

PM Peak Hour

	→	→	→	←	←	↑	↑	↓	↓	←	→	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↑	↑	↑	↑↑	↑↑↑		↑↑↑↑	↑↑↑↑	↑
Traffic Volume (vph)	0	0	0	375	3	406	565	1277	0	0	1023	504
Future Volume (vph)	0	0	0	375	3	406	565	1277	0	0	1023	504
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	265		265	260		0	250		250
Storage Lanes	0		0	1		1	2		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	0.97	0.91	1.00	1.00	0.81	1.00
Fr _t					0.912	0.850						0.850
Flt Protected					0.950	0.980		0.950				
Satd. Flow (prot)	0	0	0	1681	1515	1504	3433	5085	0	0	7544	1583
Flt Permitted					0.950	0.980		0.950				
Satd. Flow (perm)	0	0	0	1681	1515	1504	3433	5085	0	0	7544	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					55	91						498
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1284			1162			538			373	
Travel Time (s)		29.2			26.4			12.2			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	408	3	441	614	1388	0	0	1112	548
Shared Lane Traffic (%)				28%		38%						
Lane Group Flow (vph)	0	0	0	294	285	273	614	1388	0	0	1112	548
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2	1	1	2			2	1
Detector Template				Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)				20	100	20	20	100			100	20
Trailing Detector (ft)				0	0	0	0	0			0	0
Detector 1 Position(ft)				0	0	0	0	0			0	0
Detector 1 Size(ft)				20	6	20	20	6			6	20
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94		94				94	
Detector 2 Size(ft)					6		6				6	
Detector 2 Type					Cl+Ex		Cl+Ex				Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)						0.0		0.0			0.0	
Turn Type					Split	NA	Perm	Prot	NA		NA	Perm
Protected Phases				8	8		7	2 6 7			2	
Permitted Phases						8						2

Lane Group	Ø3	Ø4	Ø6
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	3	4	6
Permitted Phases			

Stapley Drive Optimization

2020

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

PM Peak Hour

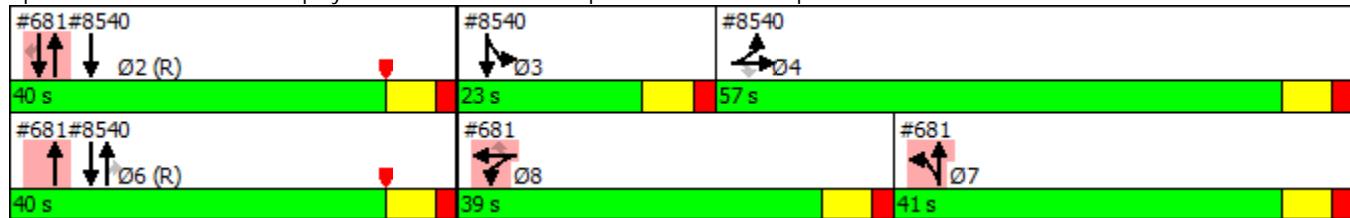


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8	8	7	2 6 7			2	2
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	10.0				15.0	15.0
Minimum Split (s)				46.5	46.5	46.5	16.5				26.5	26.5
Total Split (s)				39.0	39.0	39.0	41.0				40.0	40.0
Total Split (%)				32.5%	32.5%	32.5%	34.2%				33.3%	33.3%
Maximum Green (s)				32.5	32.5	32.5	34.5				33.5	33.5
Yellow Time (s)				4.5	4.5	4.5	4.5				4.5	4.5
All-Red Time (s)				2.0	2.0	2.0	2.0				2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0				0.0	0.0
Total Lost Time (s)				6.5	6.5	6.5	6.5				6.5	6.5
Lead/Lag				Lead	Lead	Lead	Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0				3.0	3.0
Recall Mode				Max	Max	Max	None				C-Max	C-Max
Walk Time (s)				7.0	7.0	7.0					7.0	7.0
Flash Dont Walk (s)				33.0	33.0	33.0					13.0	13.0
Pedestrian Calls (#/hr)				0	0	0					0	0
Act Effct Green (s)				32.5	32.5	32.5	34.5	74.5			33.5	33.5
Actuated g/C Ratio				0.27	0.27	0.27	0.29	0.62			0.28	0.28
v/c Ratio				0.65	0.63	0.58	0.62	0.44			0.53	0.69
Control Delay				46.3	38.0	30.3	52.5	5.4			28.0	14.7
Queue Delay				0.0	0.0	0.0	0.0	0.1			0.0	0.0
Total Delay				46.3	38.0	30.3	52.5	5.5			28.0	14.7
LOS				D	D	C	D	A			C	B
Approach Delay						38.4		19.9			23.6	
Approach LOS						D		B			C	
Queue Length 50th (ft)				212	173	127	230	32			201	233
Queue Length 95th (ft)				315	280	225	m290	84			201	354
Internal Link Dist (ft)	1204				1082			458			293	
Turn Bay Length (ft)				265		265	260				250	
Base Capacity (vph)				455	450	473	986	3156			2106	800
Starvation Cap Reductn				0	0	0	0	547			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.65	0.63	0.58	0.62	0.53			0.53	0.69

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset: 0 (0%), Referenced to phase 2:NSSB and 6:NBT, Start of Yellow	
Natural Cycle:	100
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.82
Intersection Signal Delay:	24.8
Intersection LOS:	C
Intersection Capacity Utilization:	86.0%
ICU Level of Service:	E
Analysis Period (min):	15
m	Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp



Lane Group	Ø3	Ø4	Ø6
Detector Phase			
Switch Phase			
Minimum Initial (s)	10.0	10.0	15.0
Minimum Split (s)	16.5	46.5	32.5
Total Split (s)	23.0	57.0	40.0
Total Split (%)	19%	48%	33%
Maximum Green (s)	16.5	50.5	33.5
Yellow Time (s)	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	None	Max	C-Max
Walk Time (s)		7.0	7.0
Flash Dont Walk (s)	33.0	19.0	
Pedestrian Calls (#/hr)	0	0	
Act Effect Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2020

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	714	137	188	561	99	200	1056	207	175	1069	104
Future Volume (vph)	170	714	137	188	561	99	200	1056	207	175	1069	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		0	188		0	195		180	195		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.91	0.91
Frt		0.976			0.977				0.850		0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3454	0	1770	3458	0	1770	3539	1583	1770	5019	0
Flt Permitted	0.175			0.119			0.096			0.100		
Satd. Flow (perm)	326	3454	0	222	3458	0	179	3539	1583	186	5019	0
Right Turn on Red		Yes				Yes			Yes		Yes	
Satd. Flow (RTOR)		18			17				145		15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			369			2333	
Travel Time (s)		61.7			59.7			8.4			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	776	149	204	610	108	217	1148	225	190	1162	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	185	925	0	204	718	0	217	1148	225	190	1275	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane	Yes			Yes						Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		2			8		8	4			

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2020
PM Peak Hour

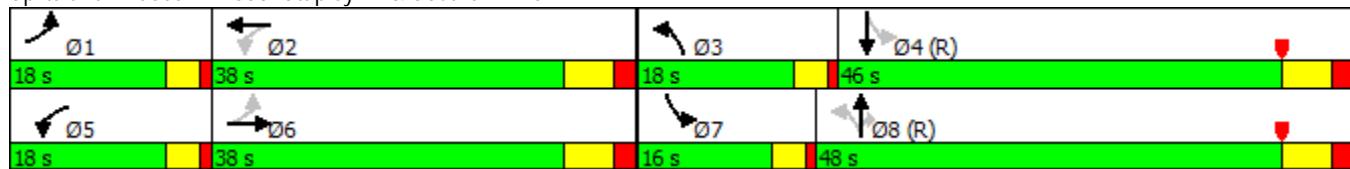


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6		5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0		8.0	15.0		8.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.0		12.0	28.0		12.0	28.0	28.0	12.0	30.0	
Total Split (s)	18.0	38.0		18.0	38.0		18.0	48.0	48.0	16.0	46.0	
Total Split (%)	15.0%	31.7%		15.0%	31.7%		15.0%	40.0%	40.0%	13.3%	38.3%	
Maximum Green (s)	14.0	31.5		14.0	31.5		14.0	41.5	41.5	12.0	39.5	
Yellow Time (s)	3.0	4.5		3.0	4.5		3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5		0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	Max		None	C-Min	C-Min	None	C-Min	
Act Effect Green (s)	47.8	35.4		49.0	36.0		57.3	44.1	44.1	53.9	42.4	
Actuated g/C Ratio	0.40	0.30		0.41	0.30		0.48	0.37	0.37	0.45	0.35	
v/c Ratio	0.67	0.90		0.79	0.68		0.83	0.88	0.33	0.81	0.72	
Control Delay	33.9	52.5		48.6	40.5		45.9	42.3	11.1	51.6	36.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	33.9	52.5		48.6	40.5		45.9	42.3	11.1	51.6	36.0	
LOS	C	D		D	D		D	D	B	D	D	
Approach Delay		49.4			42.3			38.4			38.0	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	89	361		100	256		89	490	93	90	309	
Queue Length 95th (ft)	142	#490		#215	328		#227	#574	120	#208	364	
Internal Link Dist (ft)		2634			2548			289			2253	
Turn Bay Length (ft)	198			188			195		180		195	
Base Capacity (vph)	302	1032		272	1050		272	1299	673	243	1782	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.61	0.90		0.75	0.68		0.80	0.88	0.33	0.78	0.72	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	30 (25%), Referenced to phase 4:SBTL and 8:NBT, Start of Yellow
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.90
Intersection Signal Delay:	41.4
Intersection LOS:	D
Intersection Capacity Utilization:	86.7%
ICU Level of Service:	E
Analysis Period (min):	15
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

2020

PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑		↑	↑		↑	↑	↑↓		↑	↑↓	
Traffic Volume (vph)	47	0	81	71	0	27	53	1378	67	25	1423	37
Future Volume (vph)	47	0	81	71	0	27	53	1378	67	25	1423	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		0	140		0	80		0	90		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Fr _t			0.850			0.850		0.993			0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	0	1583	1770	0	1583	1770	3514	0	1770	3525	0
Flt Permitted	0.950			0.950			0.121			0.124		
Satd. Flow (perm)	1770	0	1583	1770	0	1583	225	3514	0	231	3525	0
Right Turn on Red			Yes			Yes			No		No	
Satd. Flow (RTOR)			88			45						
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		497			563			419			1419	
Travel Time (s)		7.5			8.5			9.5			32.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	0	88	77	0	29	58	1498	73	27	1547	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	0	88	77	0	29	58	1571	0	27	1587	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1		1	1	2		1	2	
Detector Template	Left		Right	Left		Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20		20	20		20	20	100		20	100	
Trailing Detector (ft)	0		0	0		0	0	0		0	0	
Detector 1 Position(ft)	0		0	0		0	0	0		0	0	
Detector 1 Size(ft)	20		20	20		20	20	6		20	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Perm		Perm	Perm		Perm	Perm	NA		Perm	NA	
Protected Phases								2			2	
Permitted Phases	3		3	4		4	2			2		

Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

2020
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	3			3	4		4	2	2	2	2	
Switch Phase												
Minimum Initial (s)	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	15.0		15.0	15.0		15.0	20.0	20.0		20.0	20.0	
Total Split (s)	15.0		15.0	16.0		16.0	89.0	89.0		89.0	89.0	
Total Split (%)	12.5%		12.5%	13.3%		13.3%	74.2%	74.2%		74.2%	74.2%	
Maximum Green (s)	11.0		11.0	12.0		12.0	85.0	85.0		85.0	85.0	
Yellow Time (s)	3.5		3.5	3.5		3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5		0.5	0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead		Lead	Lag		Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0		3.0	3.0		3.0	3.0	3.0		3.0	3.0	
Recall Mode	None		None	None		None	C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	8.6		8.6	10.0		10.0	91.5	91.5		91.5	91.5	
Actuated g/C Ratio	0.07		0.07	0.08		0.08	0.76	0.76		0.76	0.76	
v/c Ratio	0.40		0.45	0.52		0.17	0.34	0.59		0.15	0.59	
Control Delay	62.0		18.3	65.1		9.1	22.0	19.7		3.1	7.4	
Queue Delay	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay	62.0		18.3	65.1		9.1	22.0	19.7		3.1	7.4	
LOS	E		B	E		A	C	B		A	A	
Approach Delay	34.4				49.8			19.7			7.3	
Approach LOS		C			D			B			A	
Queue Length 50th (ft)	38		0	58		0	29	438		1	508	
Queue Length 95th (ft)	79		51	108		18	m71	598		m2	606	
Internal Link Dist (ft)		417			483			339			1339	
Turn Bay Length (ft)	80			140			80			90		
Base Capacity (vph)	162		225	177		199	171	2679		176	2687	
Starvation Cap Reductn	0		0	0		0	0	0		0	0	
Spillback Cap Reductn	0		0	0		0	0	0		0	0	
Storage Cap Reductn	0		0	0		0	0	0		0	0	
Reduced v/c Ratio	0.31		0.39	0.44		0.15	0.34	0.59		0.15	0.59	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Yellow

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 15.5

Intersection LOS: B

Intersection Capacity Utilization 59.5%

ICU Level of Service B

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8325: Stapley Dr & Hilton Avenue



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AZTEC Engineering

Synchro 9 Report

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Stapley Drive Optimization
8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

2020
PM Peak Hour

	→	→	→	←	←	↑	↑	↓	↓	←	→	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1					1 1 1 1	1	1	1 1	1 1 1
Traffic Volume (vph)	517	6	902	0	0	0	0	1319	591	333	1032	0
Future Volume (vph)	517	6	902	0	0	0	0	1319	591	333	1032	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	260		260	0			0	260		260	265	0
Storage Lanes	1		1	0			0	2		1	2	0
Taper Length (ft)	25			25				25			25	
Lane Util. Factor	0.95	0.91	0.95	1.00	1.00	1.00	1.00	0.81	1.00	0.97	0.91	1.00
Fr _t			0.868	0.850					0.850			
Flt Protected	0.950	0.995								0.950		
Satd. Flow (prot)	1681	1464	1504	0	0	0	0	7544	1583	3433	5085	0
Flt Permitted	0.950	0.995								0.950		
Satd. Flow (perm)	1681	1464	1504	0	0	0	0	7544	1583	3433	5085	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		44	91						642			
Link Speed (mph)		30		30			30			30		
Link Distance (ft)		1281		1130			492			538		
Travel Time (s)		29.1		25.7			11.2			12.2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	562	7	980	0	0	0	0	1434	642	362	1122	0
Shared Lane Traffic (%)	10%		47%									
Lane Group Flow (vph)	506	524	519	0	0	0	0	1434	642	362	1122	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12		12			24			24		
Link Offset(ft)		0		0			0			0		
Crosswalk Width(ft)		16		16			16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1					2	1	1	2	
Detector Template	Left	Thru	Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20					100	20	20	100	
Trailing Detector (ft)	0	0	0					0	0	0	0	
Detector 1 Position(ft)	0	0	0					0	0	0	0	
Detector 1 Size(ft)	20	6	20					6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94				94			94			
Detector 2 Size(ft)		6				6			6			
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	4	4						6		3	2 3 6	
Permitted Phases			4						6			

Lane Group	Ø2	Ø7	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	2	7	8
Permitted Phases			

Stapley Drive Optimization
8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

2020
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4					6	6	3	2	3 6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0					15.0	15.0	10.0		
Minimum Split (s)	46.5	46.5	46.5					32.5	32.5	16.5		
Total Split (s)	57.0	57.0	57.0					40.0	40.0	23.0		
Total Split (%)	47.5%	47.5%	47.5%					33.3%	33.3%	19.2%		
Maximum Green (s)	50.5	50.5	50.5					33.5	33.5	16.5		
Yellow Time (s)	4.5	4.5	4.5					4.5	4.5	4.5		
All-Red Time (s)	2.0	2.0	2.0					2.0	2.0	2.0		
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5					6.5	6.5	6.5		
Lead/Lag	Lag	Lag	Lag								Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0		
Recall Mode	Max	Max	Max					C-Max	C-Max	None		
Walk Time (s)	7.0	7.0	7.0					7.0	7.0			
Flash Dont Walk (s)	33.0	33.0	33.0					19.0	19.0			
Pedestrian Calls (#/hr)	0	0	0					0	0			
Act Effct Green (s)	50.5	50.5	50.5					33.5	33.5	16.5	56.5	
Actuated g/C Ratio	0.42	0.42	0.42					0.28	0.28	0.14	0.47	
v/c Ratio	0.72	0.82	0.76					0.68	0.71	0.77	0.47	
Control Delay	35.7	40.0	32.5					40.5	7.6	48.5	12.6	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	35.7	40.0	32.5					40.5	7.6	48.5	12.6	
LOS	D	D	C					D	A	D	B	
Approach Delay		36.1						30.3			21.3	
Approach LOS		D						C			C	
Queue Length 50th (ft)	335	359	296					244	0	146	71	
Queue Length 95th (ft)	477	#572	452					280	104	#201	88	
Internal Link Dist (ft)		1201		1050				412			458	
Turn Bay Length (ft)	260		260					260	265			
Base Capacity (vph)	707	641	685					2106	904	472	2394	
Starvation Cap Reductn	0	0	0					0	0	0	0	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.72	0.82	0.76					0.68	0.71	0.77	0.47	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 29.5

Intersection LOS: C

Intersection Capacity Utilization 86.0%

ICU Level of Service E

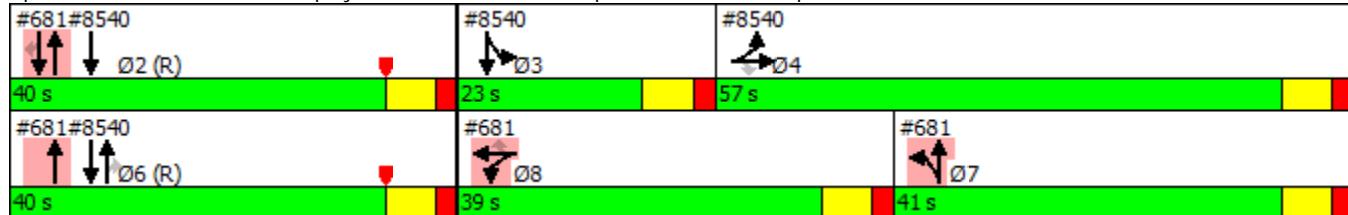
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Lane Group	Ø2	Ø7	Ø8
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	10.0	10.0
Minimum Split (s)	26.5	16.5	46.5
Total Split (s)	40.0	41.0	39.0
Total Split (%)	33%	34%	33%
Maximum Green (s)	33.5	34.5	32.5
Yellow Time (s)	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	C-Max	None	Max
Walk Time (s)	7.0		7.0
Flash Dont Walk (s)	13.0		33.0
Pedestrian Calls (#/hr)	0		0
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Queue shown is maximum after two cycles.

Splits and Phases: 8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp



Stapley Drive Optimization

2030

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

AM Peak Hour

	→	→	→	←	←	↑	↑	↓	↓	←	→	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↑	↑	↑	↑↑	↑↑↑		↑↑↑↑		↑
Traffic Volume (vph)	0	0	0	613	12	413	600	935	0	0	964	510
Future Volume (vph)	0	0	0	613	12	413	600	935	0	0	964	510
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	265		265	260		0	250		250
Storage Lanes	0		0	1		1	2		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	0.97	0.91	1.00	1.00	0.81	1.00
Fr _t					0.961	0.850						0.850
Flt Protected					0.950	0.966		0.950				
Satd. Flow (prot)	0	0	0	1681	1574	1504	3433	5085	0	0	7544	1583
Flt Permitted					0.950	0.966		0.950				
Satd. Flow (perm)	0	0	0	1681	1574	1504	3433	5085	0	0	7544	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					15	114						491
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1284			1162			538			373	
Travel Time (s)		29.2			26.4			12.2			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	666	13	449	652	1016	0	0	1048	554
Shared Lane Traffic (%)				41%		22%						
Lane Group Flow (vph)	0	0	0	393	385	350	652	1016	0	0	1048	554
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2	1	1	2			2	1
Detector Template				Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)				20	100	20	20	100			100	20
Trailing Detector (ft)				0	0	0	0	0			0	0
Detector 1 Position(ft)				0	0	0	0	0			0	0
Detector 1 Size(ft)				20	6	20	20	6			6	20
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94		94				94	
Detector 2 Size(ft)					6		6				6	
Detector 2 Type					Cl+Ex		Cl+Ex				Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)						0.0		0.0			0.0	
Turn Type					Split	NA	Perm	Prot	NA		NA	Perm
Protected Phases				8	8		7	2 6 7			2	
Permitted Phases						8						2

Lane Group	Ø3	Ø4	Ø6
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Fr _t			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	3	4	6
Permitted Phases			

Stapley Drive Optimization

2030

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8	8	7	2 6 7			2	2
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	10.0				15.0	15.0
Minimum Split (s)				46.5	46.5	46.5	16.5				26.5	26.5
Total Split (s)				42.0	42.0	42.0	43.0				35.0	35.0
Total Split (%)				35.0%	35.0%	35.0%	35.8%				29.2%	29.2%
Maximum Green (s)				35.5	35.5	35.5	36.5				28.5	28.5
Yellow Time (s)				4.5	4.5	4.5	4.5				4.5	4.5
All-Red Time (s)				2.0	2.0	2.0	2.0				2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0				0.0	0.0
Total Lost Time (s)				6.5	6.5	6.5	6.5				6.5	6.5
Lead/Lag				Lead	Lead	Lead	Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0				3.0	3.0
Recall Mode				Max	Max	Max	None				C-Max	C-Max
Walk Time (s)				7.0	7.0	7.0					7.0	7.0
Flash Dont Walk (s)				33.0	33.0	33.0					13.0	13.0
Pedestrian Calls (#/hr)				0	0	0					0	0
Act Effct Green (s)				35.5	35.5	35.5	36.5	71.5			28.5	28.5
Actuated g/C Ratio				0.30	0.30	0.30	0.30	0.60			0.24	0.24
v/c Ratio				0.79	0.81	0.67	0.62	0.34			0.59	0.74
Control Delay				51.8	52.2	31.6	54.2	8.5			51.0	27.8
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				51.8	52.2	31.6	54.2	8.5			51.0	27.8
LOS				D	D	C	D	A			D	C
Approach Delay						45.7			26.3		43.0	
Approach LOS						D			C		D	
Queue Length 50th (ft)				294	292	169	258	51			199	243
Queue Length 95th (ft)				#451	#465	286	311	95			241	300
Internal Link Dist (ft)	1204				1082			458			293	
Turn Bay Length (ft)				265		265	260					250
Base Capacity (vph)				497	476	525	1044	3029			1791	750
Starvation Cap Reductn				0	0	0	0	0			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.79	0.81	0.67	0.62	0.34			0.59	0.74

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NSSB and 6:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 37.4

Intersection LOS: D

Intersection Capacity Utilization 86.4%

ICU Level of Service E

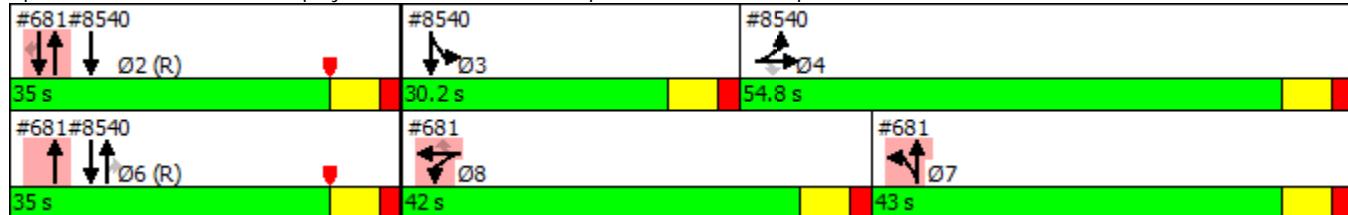
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Lane Group	Ø3	Ø4	Ø6
Detector Phase			
Switch Phase			
Minimum Initial (s)	10.0	10.0	15.0
Minimum Split (s)	16.5	46.5	32.5
Total Split (s)	30.2	54.8	35.0
Total Split (%)	25%	46%	29%
Maximum Green (s)	23.7	48.3	28.5
Yellow Time (s)	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	None	Max	C-Max
Walk Time (s)		7.0	7.0
Flash Dont Walk (s)		33.0	19.0
Pedestrian Calls (#/hr)		0	0
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Queue shown is maximum after two cycles.

Splits and Phases: 681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp



Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2030

AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	2	1	1	2	1	1	2	1	1	2	1
Traffic Volume (vph)	127	509	128	221	988	78	219	848	125	110	990	145
Future Volume (vph)	127	509	128	221	988	78	219	848	125	110	990	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		150	188		0	195		180	195		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.91	0.91
Fr _t			0.850		0.989				0.850		0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3500	0	1770	3539	1583	1770	4989	0
Flt Permitted	0.110			0.272			0.107			0.144		
Satd. Flow (perm)	205	3539	1583	507	3500	0	199	3539	1583	268	4989	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			177		8				141		23	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			359			2333	
Travel Time (s)		61.7			59.7			8.2			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	553	139	240	1074	85	238	922	136	120	1076	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	138	553	139	240	1159	0	238	922	136	120	1234	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2			8		8	4		

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2030
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		12.0	28.5	28.5	12.0	30.5	
Total Split (s)	13.0	40.0	40.0	21.0	48.0		20.0	47.0	47.0	12.0	39.0	
Total Split (%)	10.8%	33.3%	33.3%	17.5%	40.0%		16.7%	39.2%	39.2%	10.0%	32.5%	
Maximum Green (s)	9.0	33.5	33.5	17.0	41.5		16.0	40.5	40.5	8.0	32.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Min	C-Min	None	C-Min	
Walk Time (s)		4.0	4.0		4.0			4.0	4.0		4.0	
Flash Dont Walk (s)		23.0	23.0		18.0			18.0	18.0		20.0	
Pedestrian Calls (#/hr)		0	0		0			0	0		0	
Act Effct Green (s)	47.6	38.8	36.3	57.1	44.6		54.5	42.6	42.6	43.8	35.8	
Actuated g/C Ratio	0.40	0.32	0.30	0.48	0.37		0.45	0.36	0.36	0.36	0.30	
v/c Ratio	0.70	0.48	0.23	0.61	0.89		0.84	0.73	0.21	0.61	0.82	
Control Delay	43.4	34.9	3.0	26.2	44.9		42.2	29.6	8.5	33.9	43.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	43.4	34.9	3.0	26.2	44.9		42.2	29.6	8.5	33.9	43.9	
LOS	D	C	A	C	D		D	C	A	C	D	
Approach Delay		31.0			41.7			29.7			43.0	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	59	182	0	110	440		146	324	40	53	322	
Queue Length 95th (ft)	#148	244	25	168	#570		#253	391	77	#92	382	
Internal Link Dist (ft)		2634			2548			279			2253	
Turn Bay Length (ft)	198		150	188			195		180	195		
Base Capacity (vph)	199	1145	602	421	1306		299	1268	657	198	1504	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.69	0.48	0.23	0.57	0.89		0.80	0.73	0.21	0.61	0.82	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 37.1

Intersection LOS: D

Intersection Capacity Utilization 84.7%

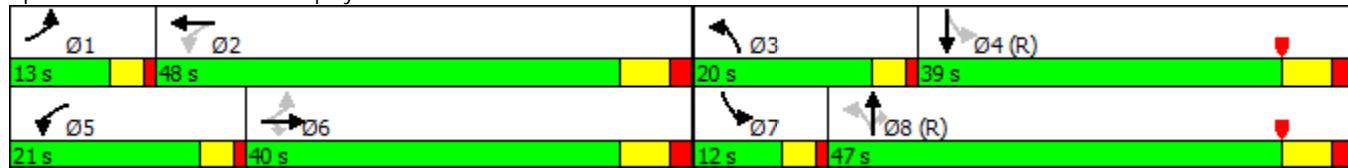
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

2030

AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑		↑	↑		↑	↑	↑↑		↑	↑↑	
Traffic Volume (vph)	87	0	106	166	0	65	51	1111	27	46	1261	30
Future Volume (vph)	87	0	106	166	0	65	51	1111	27	46	1261	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80			140		0	80		0	90		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Fr _t			0.850			0.850		0.996			0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	0	1583	1770	0	1583	1770	3525	0	1770	3525	0
Flt Permitted	0.950			0.950			0.108			0.148		
Satd. Flow (perm)	1770	0	1583	1770	0	1583	201	3525	0	276	3525	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)			103			71						
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		497			563			419			1429	
Travel Time (s)		7.5			8.5			9.5			32.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	0	115	180	0	71	55	1208	29	50	1371	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	0	115	180	0	71	55	1237	0	50	1404	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1		1	1	2		1	2	
Detector Template	Left		Right	Left		Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20		20	20		20	20	100		20	100	
Trailing Detector (ft)	0		0	0		0	0	0		0	0	
Detector 1 Position(ft)	0		0	0		0	0	0		0	0	
Detector 1 Size(ft)	20		20	20		20	20	6		20	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Perm		Perm	Perm		Perm	Perm	NA		Perm	NA	
Protected Phases								2			2	
Permitted Phases	3		3	4		4	2			2		

Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

2030
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	3			3	4		4	2	2	2	2	
Switch Phase												
Minimum Initial (s)	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0		20.0	20.0		20.0	20.0	20.0		20.0	20.0	
Total Split (s)	20.0		20.0	25.0		25.0	75.0	75.0		75.0	75.0	
Total Split (%)	16.7%		16.7%	20.8%		20.8%	62.5%	62.5%		62.5%	62.5%	
Maximum Green (s)	16.0		16.0	21.0		21.0	71.0	71.0		71.0	71.0	
Yellow Time (s)	3.5		3.5	3.5		3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5		0.5	0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead		Lead	Lag		Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0		3.0	3.0		3.0	3.0	3.0		3.0	3.0	
Recall Mode	None		None	C-Max		C-Max	None	None		None	None	
Walk Time (s)	5.0		5.0	5.0		5.0	5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	11.0		11.0	11.0		11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0		0	0		0	0	0		0	0	
Act Effct Green (s)	11.7		11.7	26.0		26.0	70.3	70.3		70.3	70.3	
Actuated g/C Ratio	0.10		0.10	0.22		0.22	0.59	0.59		0.59	0.59	
v/c Ratio	0.55		0.47	0.47		0.18	0.47	0.60		0.31	0.68	
Control Delay	63.1		18.1	47.2		10.7	25.5	11.9		6.0	7.2	
Queue Delay	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay	63.1		18.1	47.2		10.7	25.5	11.9		6.0	7.2	
LOS	E		B	D		B	C	B		A	A	
Approach Delay		38.5			36.8				12.5			7.2
Approach LOS		D			D				B			A
Queue Length 50th (ft)	71		9	123		0	14	311		4	491	
Queue Length 95th (ft)	124		63	207		41	m43	339		m5	54	
Internal Link Dist (ft)		417			483			339			1349	
Turn Bay Length (ft)	80		140			80				90		
Base Capacity (vph)	236		300	384		398	118	2085		163	2085	
Starvation Cap Reductn	0		0	0		0	0	0		0	0	
Spillback Cap Reductn	0		0	0		0	0	0		0	0	
Storage Cap Reductn	0		0	0		0	0	0		0	0	
Reduced v/c Ratio	0.40		0.38	0.47		0.18	0.47	0.59		0.31	0.67	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:WBL and 8:, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 13.7

Intersection LOS: B

Intersection Capacity Utilization 61.6%

ICU Level of Service B

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8325: Stapley Dr & Hilton Avenue



Stapley Drive Optimization

2030

8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

AM Peak Hour

	→	→	→	←	←	↑	↑	↓	↓	←	→	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	0	0	0	0	4	1	1	2	0
Traffic Volume (vph)	380	0	590	0	0	0	0	1199	340	359	1191	0
Future Volume (vph)	380	0	590	0	0	0	0	1199	340	359	1191	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	260		260	0		0	260		260	265		0
Storage Lanes	1		1	0		0	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.91	0.95	1.00	1.00	1.00	1.00	0.81	1.00	0.97	0.91	1.00
Fr _t			0.870	0.850					0.850			
Flt Protected	0.950	0.994								0.950		
Satd. Flow (prot)	1681	1466	1504	0	0	0	0	7544	1583	3433	5085	0
Flt Permitted	0.950	0.994								0.950		
Satd. Flow (perm)	1681	1466	1504	0	0	0	0	7544	1583	3433	5085	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		91	91							370		
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1281			1130			492			538	
Travel Time (s)		29.1			25.7			11.2			12.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	413	0	641	0	0	0	0	1303	370	390	1295	0
Shared Lane Traffic (%)	11%		47%									
Lane Group Flow (vph)	368	346	340	0	0	0	0	1303	370	390	1295	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1					2	1	1	2	
Detector Template	Left	Thru	Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20					100	20	20	100	
Trailing Detector (ft)	0	0	0					0	0	0	0	
Detector 1 Position(ft)	0	0	0					0	0	0	0	
Detector 1 Size(ft)	20	6	20					6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94				94			94			
Detector 2 Size(ft)		6				6			6			
Detector 2 Type		Cl+Ex						Cl+Ex		Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0		0.0		
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	4	4						6		3	2 3 6	
Permitted Phases		4						6				

Lane Group	Ø2	Ø7	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	2	7	8
Permitted Phases			

Stapley Drive Optimization

2030

8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4					6	6	3	2	3 6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0					15.0	15.0	10.0		
Minimum Split (s)	46.5	46.5	46.5					32.5	32.5	16.5		
Total Split (s)	54.8	54.8	54.8					35.0	35.0	30.2		
Total Split (%)	45.7%	45.7%	45.7%					29.2%	29.2%	25.2%		
Maximum Green (s)	48.3	48.3	48.3					28.5	28.5	23.7		
Yellow Time (s)	4.5	4.5	4.5					4.5	4.5	4.5		
All-Red Time (s)	2.0	2.0	2.0					2.0	2.0	2.0		
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5					6.5	6.5	6.5		
Lead/Lag	Lag	Lag	Lag								Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0		
Recall Mode	Max	Max	Max					C-Max	C-Max	None		
Walk Time (s)	7.0	7.0	7.0					7.0	7.0			
Flash Dont Walk (s)	33.0	33.0	33.0					19.0	19.0			
Pedestrian Calls (#/hr)	0	0	0					0	0			
Act Effct Green (s)	48.8	48.8	48.8					28.5	28.5	23.2	58.2	
Actuated g/C Ratio	0.41	0.41	0.41					0.24	0.24	0.19	0.48	
v/c Ratio	0.54	0.53	0.51					0.73	0.56	0.59	0.52	
Control Delay	30.9	23.1	22.4					45.0	7.4	36.7	13.9	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.3	
Total Delay	30.9	23.1	22.4					45.0	7.4	36.7	14.3	
LOS	C	C	C					D	A	D	B	
Approach Delay		25.6						36.7			19.4	
Approach LOS		C						D			B	
Queue Length 50th (ft)	226	162	149					231	0	140	90	
Queue Length 95th (ft)	329	265	245					266	80	m188	116	
Internal Link Dist (ft)		1201		1050				412			458	
Turn Bay Length (ft)	260		260					260	265			
Base Capacity (vph)	682	649	664					1791	658	678	2487	
Starvation Cap Reductn	0	0	0					0	0	0	568	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.54	0.53	0.51					0.73	0.56	0.58	0.67	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 27.4

Intersection LOS: C

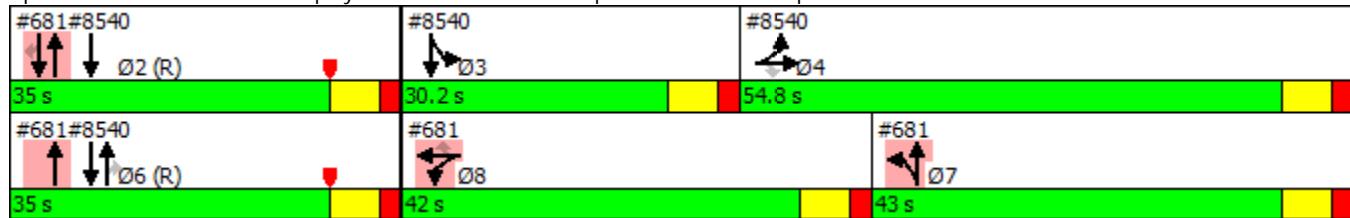
Intersection Capacity Utilization 86.4%

ICU Level of Service E

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp



Lane Group	Ø2	Ø7	Ø8
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	10.0	10.0
Minimum Split (s)	26.5	16.5	46.5
Total Split (s)	35.0	43.0	42.0
Total Split (%)	29%	36%	35%
Maximum Green (s)	28.5	36.5	35.5
Yellow Time (s)	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	C-Max	None	Max
Walk Time (s)	7.0		7.0
Flash Dont Walk (s)	13.0		33.0
Pedestrian Calls (#/hr)	0		0
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Stapley Drive Optimization

2030

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

PM Peak Hour

	→	→	→	←	←	↑	↑	↓	↓	←	→	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↑	↑	↑	↑↑	↑↑↑		↑↑↑↑	↑↑↑↑	↑
Traffic Volume (vph)	0	0	0	404	3	437	608	1376	0	0	1103	543
Future Volume (vph)	0	0	0	404	3	437	608	1376	0	0	1103	543
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	265		265	260		0	250		250
Storage Lanes	0		0	1		1	2		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	0.97	0.91	1.00	1.00	0.81	1.00
Fr _t					0.910	0.850						0.850
Flt Protected					0.950	0.981		0.950				
Satd. Flow (prot)	0	0	0	1681	1513	1504	3433	5085	0	0	7544	1583
Flt Permitted					0.950	0.981		0.950				
Satd. Flow (perm)	0	0	0	1681	1513	1504	3433	5085	0	0	7544	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					43	91						491
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1284			1162			538			373	
Travel Time (s)		29.2			26.4			12.2			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	439	3	475	661	1496	0	0	1199	590
Shared Lane Traffic (%)				27%		39%						
Lane Group Flow (vph)	0	0	0	320	307	290	661	1496	0	0	1199	590
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2	1	1	2			2	1
Detector Template				Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)				20	100	20	20	100			100	20
Trailing Detector (ft)				0	0	0	0	0			0	0
Detector 1 Position(ft)				0	0	0	0	0			0	0
Detector 1 Size(ft)				20	6	20	20	6			6	20
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94		94				94	
Detector 2 Size(ft)					6		6				6	
Detector 2 Type					Cl+Ex		Cl+Ex				Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)						0.0		0.0			0.0	
Turn Type					Split	NA	Perm	Prot	NA		NA	Perm
Protected Phases					8	8		7 2 6 7			2	
Permitted Phases						8						2

Lane Group	Ø3	Ø4	Ø6
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	3	4	6
Permitted Phases			

Stapley Drive Optimization

2030

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8	8	7	2 6 7			2	2
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	10.0				15.0	15.0
Minimum Split (s)				46.5	46.5	46.5	16.5				26.5	26.5
Total Split (s)				39.0	39.0	39.0	41.0				40.0	40.0
Total Split (%)				32.5%	32.5%	32.5%	34.2%				33.3%	33.3%
Maximum Green (s)				32.5	32.5	32.5	34.5				33.5	33.5
Yellow Time (s)				4.5	4.5	4.5	4.5				4.5	4.5
All-Red Time (s)				2.0	2.0	2.0	2.0				2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0				0.0	0.0
Total Lost Time (s)				6.5	6.5	6.5	6.5				6.5	6.5
Lead/Lag				Lead	Lead	Lead	Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0				3.0	3.0
Recall Mode				Max	Max	Max	None				C-Max	C-Max
Walk Time (s)				7.0	7.0	7.0					7.0	7.0
Flash Dont Walk (s)				33.0	33.0	33.0					13.0	13.0
Pedestrian Calls (#/hr)				0	0	0					0	0
Act Effct Green (s)				32.5	32.5	32.5	34.5	74.5			33.5	33.5
Actuated g/C Ratio				0.27	0.27	0.27	0.29	0.62			0.28	0.28
v/c Ratio				0.70	0.70	0.61	0.67	0.47			0.57	0.74
Control Delay				49.0	43.1	32.1	53.3	6.7			24.7	16.7
Queue Delay				0.0	0.0	0.0	0.0	0.1			0.0	0.0
Total Delay				49.0	43.1	32.1	53.3	6.8			24.7	16.7
LOS				D	D	C	D	A			C	B
Approach Delay						41.7			21.1			22.1
Approach LOS						D			C			C
Queue Length 50th (ft)				235	203	142	249	61			212	290
Queue Length 95th (ft)				347	320	244	m317	116			195	411
Internal Link Dist (ft)	1204				1082			458			293	
Turn Bay Length (ft)				265		265	260					250
Base Capacity (vph)				455	441	473	986	3156			2106	795
Starvation Cap Reductn				0	0	0	0	547			0	0
Spillback Cap Reductn				0	0	0	0	50			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.70	0.70	0.61	0.67	0.57			0.57	0.74

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NSSB and 6:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 25.3

Intersection LOS: C

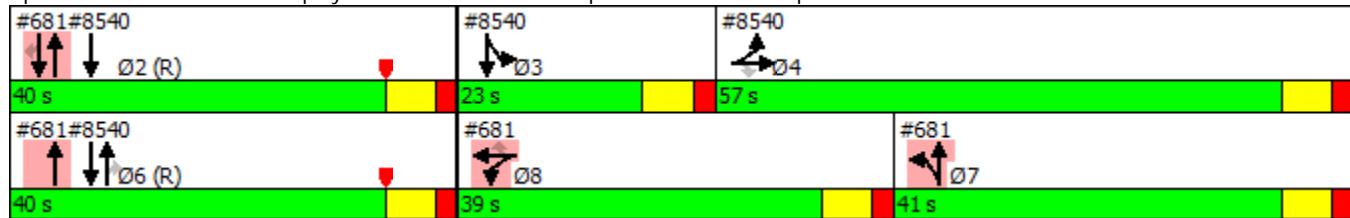
Intersection Capacity Utilization 91.4%

ICU Level of Service F

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp



Lane Group	Ø3	Ø4	Ø6
Detector Phase			
Switch Phase			
Minimum Initial (s)	10.0	10.0	15.0
Minimum Split (s)	16.5	46.5	32.5
Total Split (s)	23.0	57.0	40.0
Total Split (%)	19%	48%	33%
Maximum Green (s)	16.5	50.5	33.5
Yellow Time (s)	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	None	Max	C-Max
Walk Time (s)		7.0	7.0
Flash Dont Walk (s)	33.0	19.0	
Pedestrian Calls (#/hr)	0	0	
Act Effect Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2030

PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑		↑	↑↑	↑	↑	↑↑↑	
Traffic Volume (vph)	183	769	148	202	604	107	215	1138	223	189	1152	112
Future Volume (vph)	183	769	148	202	604	107	215	1138	223	189	1152	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		150	188		0	195		180	195		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.91	0.91
Fr _t			0.850		0.977				0.850		0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3458	0	1770	3539	1583	1770	5019	0
Flt Permitted	0.132			0.123			0.097			0.100		
Satd. Flow (perm)	246	3539	1583	229	3458	0	181	3539	1583	186	5019	0
Right Turn on Red		Yes				Yes			Yes			Yes
Satd. Flow (RTOR)		105			17				143		15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			369			2333	
Travel Time (s)		61.7			59.7			8.4			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	199	836	161	220	657	116	234	1237	242	205	1252	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	199	836	161	220	773	0	234	1237	242	205	1374	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane	Yes			Yes							Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type	Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2			8		8	4		

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2030
PM Peak Hour

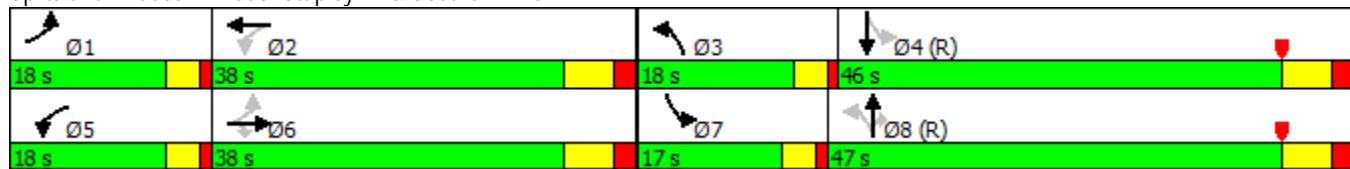


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.0	33.0	12.0	28.0		12.0	28.0	28.0	12.0	30.0	
Total Split (s)	18.0	38.0	38.0	18.0	38.0		18.0	47.0	47.0	17.0	46.0	
Total Split (%)	15.0%	31.7%	31.7%	15.0%	31.7%		15.0%	39.2%	39.2%	14.2%	38.3%	
Maximum Green (s)	14.0	31.5	31.5	14.0	31.5		14.0	40.5	40.5	13.0	39.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Min	C-Min	None	C-Min	
Act Effect Green (s)	47.5	34.6	32.1	48.5	35.1		57.2	43.6	43.6	54.8	42.4	
Actuated g/C Ratio	0.40	0.29	0.27	0.40	0.29		0.48	0.36	0.36	0.46	0.35	
v/c Ratio	0.76	0.82	0.32	0.83	0.76		0.88	0.96	0.36	0.83	0.77	
Control Delay	44.4	47.8	15.4	53.4	43.6		53.4	50.6	11.5	53.5	37.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	44.4	47.8	15.4	53.4	43.6		53.4	50.6	11.5	53.5	37.7	
LOS	D	D	B	D	D		D	D	B	D	D	
Approach Delay		42.9			45.7			45.5			39.8	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	97	320	33	112	284		104	534	98	101	342	
Queue Length 95th (ft)	#192	400	92	#243	360		#263	#664	126	#225	401	
Internal Link Dist (ft)		2634			2548			289			2253	
Turn Bay Length (ft)	198		150	188			195		180	195		
Base Capacity (vph)	277	1019	499	273	1022		272	1287	666	257	1783	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.72	0.82	0.32	0.81	0.76		0.86	0.96	0.36	0.80	0.77	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	30 (25%), Referenced to phase 4:SBTL and 8:NBT, Start of Yellow
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.96
Intersection Signal Delay:	43.3
Intersection Capacity Utilization	87.7%
Analysis Period (min)	15
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

2030

PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑		↑	↑		↑	↑	↑↓		↑	↑↓	
Traffic Volume (vph)	47	0	81	71	0	27	53	1484	67	25	1553	37
Future Volume (vph)	47	0	81	71	0	27	53	1484	67	25	1553	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		0	140		0	80		0	90		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Fr _t			0.850			0.850		0.994			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	0	1583	1770	0	1583	1770	3518	0	1770	3529	0
Flt Permitted	0.950			0.950			0.098			0.105		
Satd. Flow (perm)	1770	0	1583	1770	0	1583	183	3518	0	196	3529	0
Right Turn on Red			Yes			Yes			No		No	
Satd. Flow (RTOR)			88			45						
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		497			563			419			1419	
Travel Time (s)		7.5			8.5			9.5			32.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	0	88	77	0	29	58	1613	73	27	1688	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	0	88	77	0	29	58	1686	0	27	1728	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1		1	1	2		1	2	
Detector Template	Left		Right	Left		Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20		20	20		20	20	100		20	100	
Trailing Detector (ft)	0		0	0		0	0	0		0	0	
Detector 1 Position(ft)	0		0	0		0	0	0		0	0	
Detector 1 Size(ft)	20		20	20		20	20	6		20	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Perm		Perm	Perm		Perm	Perm	NA		Perm	NA	
Protected Phases								2			2	
Permitted Phases	3		3	4		4	2			2		

Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

2030
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	3			3	4		4	2	2	2	2	
Switch Phase												
Minimum Initial (s)	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	15.0		15.0	15.0		15.0	20.0	20.0		20.0	20.0	
Total Split (s)	15.0		15.0	16.0		16.0	89.0	89.0		89.0	89.0	
Total Split (%)	12.5%		12.5%	13.3%		13.3%	74.2%	74.2%		74.2%	74.2%	
Maximum Green (s)	11.0		11.0	12.0		12.0	85.0	85.0		85.0	85.0	
Yellow Time (s)	3.5		3.5	3.5		3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5		0.5	0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead		Lead	Lag		Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0		3.0	3.0		3.0	3.0	3.0		3.0	3.0	
Recall Mode	None		None	None		None	C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	8.6		8.6	10.0		10.0	91.5	91.5		91.5	91.5	
Actuated g/C Ratio	0.07		0.07	0.08		0.08	0.76	0.76		0.76	0.76	
v/c Ratio	0.40		0.45	0.52		0.17	0.42	0.63		0.18	0.64	
Control Delay	62.0		18.3	65.1		9.1	26.8	19.7		3.4	8.4	
Queue Delay	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay	62.0		18.3	65.1		9.1	26.8	19.7		3.4	8.4	
LOS	E		B	E		A	C	B		A	A	
Approach Delay	34.4				49.8			19.9			8.3	
Approach LOS		C			D			B			A	
Queue Length 50th (ft)	38		0	58		0	28	454		1	600	
Queue Length 95th (ft)	79		51	108		18	m79	655		m1	694	
Internal Link Dist (ft)		417			483			339			1339	
Turn Bay Length (ft)	80			140			80			90		
Base Capacity (vph)	162		225	177		199	139	2682		149	2690	
Starvation Cap Reductn	0		0	0		0	0	0		0	0	
Spillback Cap Reductn	0		0	0		0	0	0		0	0	
Storage Cap Reductn	0		0	0		0	0	0		0	0	
Reduced v/c Ratio	0.31		0.39	0.44		0.15	0.42	0.63		0.18	0.64	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Yellow	
Natural Cycle:	70
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.64
Intersection Signal Delay:	15.9
Intersection LOS:	B
Intersection Capacity Utilization	63.1%
ICU Level of Service	B
Analysis Period (min)	15
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 8325: Stapley Dr & Hilton Avenue



89 s

Stapley Drive Optimization 09/29/2016 2030

AZTEC Engineering

Synchro 9 Report

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Stapley Drive Optimization

2030

8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

PM Peak Hour

	→	→	→	←	←	↑	↑	↓	↓	←	→	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1					4	1	1	1	1
Traffic Volume (vph)	557	7	971	0	0	0	0	1421	637	359	1112	0
Future Volume (vph)	557	7	971	0	0	0	0	1421	637	359	1112	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	260		260	0			0	260		260	265	0
Storage Lanes	1		1	0			0	2		1	2	0
Taper Length (ft)	25			25				25			25	
Lane Util. Factor	0.95	0.91	0.95	1.00	1.00	1.00	1.00	0.81	1.00	0.97	0.91	1.00
Fr _t			0.868	0.850					0.850			
Flt Protected	0.950	0.995								0.950		
Satd. Flow (prot)	1681	1464	1504	0	0	0	0	7544	1583	3433	5085	0
Flt Permitted	0.950	0.995								0.950		
Satd. Flow (perm)	1681	1464	1504	0	0	0	0	7544	1583	3433	5085	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34	91						692			
Link Speed (mph)		30		30			30			30		
Link Distance (ft)		1281		1130			492			538		
Travel Time (s)		29.1		25.7			11.2			12.2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	605	8	1055	0	0	0	0	1545	692	390	1209	0
Shared Lane Traffic (%)	10%		47%									
Lane Group Flow (vph)	544	565	559	0	0	0	0	1545	692	390	1209	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12		12			24			24		
Link Offset(ft)		0		0			0			0		
Crosswalk Width(ft)		16		16			16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1					2	1	1	2	
Detector Template	Left	Thru	Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20					100	20	20	100	
Trailing Detector (ft)	0	0	0					0	0	0	0	
Detector 1 Position(ft)	0	0	0					0	0	0	0	
Detector 1 Size(ft)	20	6	20					6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94				94			94			
Detector 2 Size(ft)		6				6			6			
Detector 2 Type		Cl+Ex						Cl+Ex		Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0		0.0		
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	4	4						6		3	2 3 6	
Permitted Phases			4						6			

Lane Group	Ø2	Ø7	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	2	7	8
Permitted Phases			

Stapley Drive Optimization

2030

8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Detector Phase	4	4	4					6	6	3	2	3	6
Switch Phase													
Minimum Initial (s)	10.0	10.0	10.0					15.0	15.0	10.0			
Minimum Split (s)	46.5	46.5	46.5					32.5	32.5	16.5			
Total Split (s)	57.0	57.0	57.0					40.0	40.0	23.0			
Total Split (%)	47.5%	47.5%	47.5%					33.3%	33.3%	19.2%			
Maximum Green (s)	50.5	50.5	50.5					33.5	33.5	16.5			
Yellow Time (s)	4.5	4.5	4.5					4.5	4.5	4.5			
All-Red Time (s)	2.0	2.0	2.0					2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0			
Total Lost Time (s)	6.5	6.5	6.5					6.5	6.5	6.5			
Lead/Lag	Lag	Lag	Lag								Lead		
Lead-Lag Optimize?													
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0			
Recall Mode	Max	Max	Max					C-Max	C-Max	None			
Walk Time (s)	7.0	7.0	7.0					7.0	7.0				
Flash Dont Walk (s)	33.0	33.0	33.0					19.0	19.0				
Pedestrian Calls (#/hr)	0	0	0					0	0				
Act Effct Green (s)	50.5	50.5	50.5					33.5	33.5	16.5	56.5		
Actuated g/C Ratio	0.42	0.42	0.42					0.28	0.28	0.14	0.47		
v/c Ratio	0.77	0.89	0.82					0.73	0.74	0.83	0.51		
Control Delay	38.5	48.2	36.6					41.7	8.0	51.9	13.0		
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0		
Total Delay	38.5	48.2	36.6					41.7	8.0	51.9	13.0		
LOS	D	D	D					D	A	D	B		
Approach Delay		41.2						31.3			22.5		
Approach LOS		D						C			C		
Queue Length 50th (ft)	373	416	340					268	0	159	79		
Queue Length 95th (ft)	528	#662	#529					305	110	#229	95		
Internal Link Dist (ft)		1201		1050				412			458		
Turn Bay Length (ft)	260		260					260	265				
Base Capacity (vph)	707	635	685					2106	940	472	2394		
Starvation Cap Reductn	0	0	0					0	0	0	0		
Spillback Cap Reductn	0	0	0					0	0	0	0		
Storage Cap Reductn	0	0	0					0	0	0	0		
Reduced v/c Ratio	0.77	0.89	0.82					0.73	0.74	0.83	0.51		

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 31.7

Intersection LOS: C

Intersection Capacity Utilization 91.4%

ICU Level of Service F

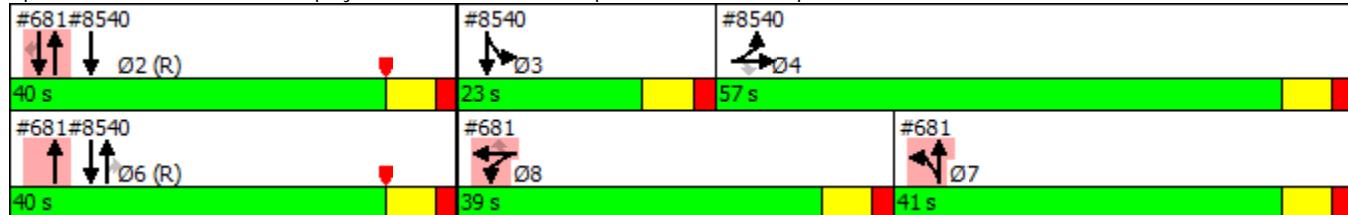
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Lane Group	Ø2	Ø7	Ø8
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	10.0	10.0
Minimum Split (s)	26.5	16.5	46.5
Total Split (s)	40.0	41.0	39.0
Total Split (%)	33%	34%	33%
Maximum Green (s)	33.5	34.5	32.5
Yellow Time (s)	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	C-Max	None	Max
Walk Time (s)	7.0		7.0
Flash Dont Walk (s)	13.0		33.0
Pedestrian Calls (#/hr)	0		0
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Queue shown is maximum after two cycles.

Splits and Phases: 8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp



Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2040
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
Lane Configurations	↑↑	↑↑	↑	↑↑	↑↑	↑	↑↑	↑↑↑		↑↑	↑↑↑	
Traffic Volume (vph)	136	548	138	238	1065	84	236	914	135	118	1067	157
Future Volume (vph)	136	548	138	238	1065	84	236	914	135	118	1067	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		150	188		150	195		180	195		0
Storage Lanes	2		1	2		1	2		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	0.91	0.97	0.91	0.91
Fr _t			0.850			0.850		0.981			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	4989	0	3433	4989	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	4989	0	3433	4989	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			141			105		24			23	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			359			2333	
Travel Time (s)		61.7			59.7			8.2			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	596	150	259	1158	91	257	993	147	128	1160	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	148	596	150	259	1158	91	257	1140	0	128	1331	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes					Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex								
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex		Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0		0.0		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2						

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2040
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2	2	3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0	15.0	8.0	15.0		8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5	28.5	12.0	28.5		12.0	30.5	
Total Split (s)	22.0	41.0	41.0	22.0	41.0	41.0	16.0	41.0		16.0	41.0	
Total Split (%)	18.3%	34.2%	34.2%	18.3%	34.2%	34.2%	13.3%	34.2%		13.3%	34.2%	
Maximum Green (s)	18.0	34.5	34.5	18.0	34.5	34.5	12.0	34.5		12.0	34.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5		3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0	6.5	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max	Max	None	Max	Max	None	C-Min		None	C-Min	
Walk Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Flash Dont Walk (s)	23.0	23.0			18.0	18.0		18.0			20.0	
Pedestrian Calls (#/hr)	0	0			0	0		0			0	
Act Effct Green (s)	10.6	40.8	38.3	14.3	44.5	42.0	11.7	39.0		9.9	37.2	
Actuated g/C Ratio	0.09	0.34	0.32	0.12	0.37	0.35	0.10	0.32		0.08	0.31	
v/c Ratio	0.49	0.50	0.25	0.64	0.88	0.15	0.77	0.70		0.45	0.85	
Control Delay	57.3	33.7	7.2	57.4	44.9	4.5	51.7	29.0		57.4	44.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	57.3	33.7	7.2	57.4	44.9	4.5	51.7	29.0		57.4	44.6	
LOS	E	C	A	E	D	A	D	C		E	D	
Approach Delay		33.2			44.6			33.2			45.7	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	57	192	5	100	437	0	98	272		49	348	
Queue Length 95th (ft)	89	260	55	139	#598	29	#152	330		80	410	
Internal Link Dist (ft)		2634			2548			279			2253	
Turn Bay Length (ft)	198		150	188		150	195			195		
Base Capacity (vph)	514	1204	601	514	1312	622	343	1638		343	1561	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.29	0.50	0.25	0.50	0.88	0.15	0.75	0.70		0.37	0.85	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:SBT and 8:NBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 39.9

Intersection LOS: D

Intersection Capacity Utilization 80.3%

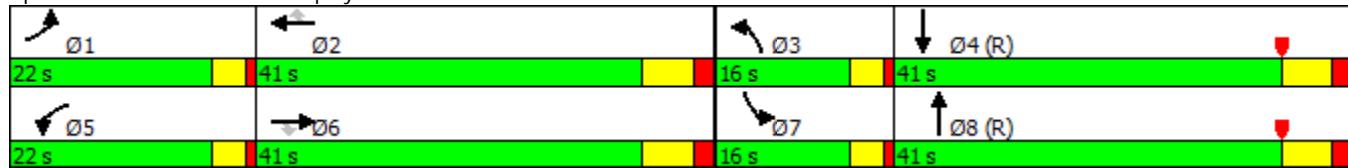
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

2040
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑		↑	↑		↑	↑	↑↓		↑	↑↓	
Traffic Volume (vph)	87	0	106	166	0	65	51	1198	27	46	1359	30
Future Volume (vph)	87	0	106	166	0	65	51	1198	27	46	1359	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80			140		0	80		0	90		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Fr _t			0.850			0.850		0.997			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	0	1583	1770	0	1583	1770	3529	0	1770	3529	0
Flt Permitted	0.950			0.950			0.091			0.130		
Satd. Flow (perm)	1770	0	1583	1770	0	1583	170	3529	0	242	3529	0
Right Turn on Red			Yes			Yes			No		No	
Satd. Flow (RTOR)			77			71						
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		497			563			419			1429	
Travel Time (s)		7.5			8.5			9.5			32.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	0	115	180	0	71	55	1331	0	50	1510	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	0	115	180	0	71	55	1331	0	50	1510	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1		1	1	2		1	2	
Detector Template	Left		Right	Left		Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20		20	20		20	20	100		20	100	
Trailing Detector (ft)	0		0	0		0	0	0		0	0	
Detector 1 Position(ft)	0		0	0		0	0	0		0	0	
Detector 1 Size(ft)	20		20	20		20	20	6		20	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Perm		Perm	Perm		Perm	Perm	NA		Perm	NA	
Protected Phases								2			2	
Permitted Phases	3		3	4		4	2			2		

Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

2040
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	3			3	4		4	2	2	2	2	
Switch Phase												
Minimum Initial (s)	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0		20.0	20.0		20.0	20.0	20.0		20.0	20.0	
Total Split (s)	22.0		22.0	22.0		22.0	76.0	76.0		76.0	76.0	
Total Split (%)	18.3%		18.3%	18.3%		18.3%	63.3%	63.3%		63.3%	63.3%	
Maximum Green (s)	18.0		18.0	18.0		18.0	72.0	72.0		72.0	72.0	
Yellow Time (s)	3.5		3.5	3.5		3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5		0.5	0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead		Lead	Lag		Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0		3.0	3.0		3.0	3.0	3.0		3.0	3.0	
Recall Mode	None		None	C-Max		C-Max	None	None		None	None	
Walk Time (s)	5.0		5.0	5.0		5.0	5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	11.0		11.0	11.0		11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0		0	0		0	0	0		0	0	
Act Effct Green (s)	11.8		11.8	24.2		24.2	72.0	72.0		72.0	72.0	
Actuated g/C Ratio	0.10		0.10	0.20		0.20	0.60	0.60		0.60	0.60	
v/c Ratio	0.55		0.51	0.50		0.19	0.54	0.63		0.34	0.71	
Control Delay	62.7		27.5	49.4		11.1	34.8	13.0		5.3	5.4	
Queue Delay	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay	62.7		27.5	49.4		11.1	34.8	13.0		5.3	5.4	
LOS	E		C	D		B	C	B		A	A	
Approach Delay		43.5			38.5				13.9			5.4
Approach LOS		D			D			B				A
Queue Length 50th (ft)	71		28	125		0	19	317		2	503	
Queue Length 95th (ft)	123		84	210		42	m52	378		m2	73	
Internal Link Dist (ft)		417			483			339				1349
Turn Bay Length (ft)	80		140			80				90		
Base Capacity (vph)	265		302	357		376	102	2117		145	2117	
Starvation Cap Reductn	0		0	0		0	0	0		0	0	
Spillback Cap Reductn	0		0	0		0	0	0		0	0	
Storage Cap Reductn	0		0	0		0	0	0		0	0	
Reduced v/c Ratio	0.36		0.38	0.50		0.19	0.54	0.63		0.34	0.71	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:WBL and 8:, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 13.6

Intersection LOS: B

Intersection Capacity Utilization 64.3%

ICU Level of Service C

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

2040
AM Peak Hour

Splits and Phases: 8325: Stapley Dr & Hilton Avenue



Stapley Drive Optimization

2040

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

AM Peak Hour

	→	→	→	←	←	↑	↑	↓	↓	←	→	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↑	↑	↑	↑↑	↑↑↑		↑↑↑↑	↑↑↑↑	↑
Traffic Volume (vph)	0	0	0	660	13	445	646	1007	0	0	1038	549
Future Volume (vph)	0	0	0	660	13	445	646	1007	0	0	1038	549
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	265		265	260		0	250		250
Storage Lanes	0		0	1		1	2		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	0.97	0.91	1.00	1.00	0.81	1.00
Fr _t					0.962	0.850						0.850
Flt Protected					0.950	0.966		0.950				
Satd. Flow (prot)	0	0	0	1681	1575	1504	3433	5085	0	0	7544	1583
Flt Permitted					0.950	0.966		0.950				
Satd. Flow (perm)	0	0	0	1681	1575	1504	3433	5085	0	0	7544	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					15	92						491
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1284			1162			538			373	
Travel Time (s)		29.2			26.4			12.2			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	717	14	484	702	1095	0	0	1128	597
Shared Lane Traffic (%)				41%		22%						
Lane Group Flow (vph)	0	0	0	423	414	378	702	1095	0	0	1128	597
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2	1	1	2			2	1
Detector Template				Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)				20	100	20	20	100			100	20
Trailing Detector (ft)				0	0	0	0	0			0	0
Detector 1 Position(ft)				0	0	0	0	0			0	0
Detector 1 Size(ft)				20	6	20	20	6			6	20
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94		94				94	
Detector 2 Size(ft)					6		6				6	
Detector 2 Type					Cl+Ex		Cl+Ex				Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0		0.0				0.0	
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				8	8		7	2 6 7			2	
Permitted Phases					8						2	

Lane Group	Ø3	Ø4	Ø6
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	3	4	6
Permitted Phases			

Stapley Drive Optimization

2040

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8	8	7	2 6 7			2	2
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	10.0				15.0	15.0
Minimum Split (s)				46.5	46.5	46.5	16.5				26.5	26.5
Total Split (s)				43.0	43.0	43.0	43.0				34.0	34.0
Total Split (%)				35.8%	35.8%	35.8%	35.8%				28.3%	28.3%
Maximum Green (s)				36.5	36.5	36.5	36.5				27.5	27.5
Yellow Time (s)				4.5	4.5	4.5	4.5				4.5	4.5
All-Red Time (s)				2.0	2.0	2.0	2.0				2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0				0.0	0.0
Total Lost Time (s)				6.5	6.5	6.5	6.5				6.5	6.5
Lead/Lag				Lead	Lead	Lead	Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0				3.0	3.0
Recall Mode				Max	Max	Max	None				C-Max	C-Max
Walk Time (s)				7.0	7.0	7.0					7.0	7.0
Flash Dont Walk (s)				33.0	33.0	33.0					13.0	13.0
Pedestrian Calls (#/hr)				0	0	0					0	0
Act Effct Green (s)				36.5	36.5	36.5	36.5	70.5			27.5	27.5
Actuated g/C Ratio				0.30	0.30	0.30	0.30	0.59			0.23	0.23
v/c Ratio				0.83	0.85	0.73	0.67	0.37			0.65	0.81
Control Delay				54.0	54.9	37.0	54.5	12.1			51.9	31.3
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				54.0	54.9	37.0	54.5	12.1			51.9	31.3
LOS				D	D	D	D	B			D	C
Approach Delay						49.0					44.8	
Approach LOS						D					D	
Queue Length 50th (ft)				320	318	211	278	80			218	279
Queue Length 95th (ft)				#494	#509	337	332	132			261	344
Internal Link Dist (ft)	1204				1082			458			293	
Turn Bay Length (ft)				265		265	260					250
Base Capacity (vph)				511	489	521	1044	2987			1728	741
Starvation Cap Reductn				0	0	0	0	0			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.83	0.85	0.73	0.67	0.37			0.65	0.81

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBT, Start of Yellow	
Natural Cycle:	100
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.85
Intersection Signal Delay: 39.7	Intersection LOS: D
Intersection Capacity Utilization 91.8%	ICU Level of Service F
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	

Lane Group	Ø3	Ø4	Ø6
Detector Phase			
Switch Phase			
Minimum Initial (s)	10.0	10.0	15.0
Minimum Split (s)	16.5	46.5	32.5
Total Split (s)	31.4	54.6	34.0
Total Split (%)	26%	46%	28%
Maximum Green (s)	24.9	48.1	27.5
Yellow Time (s)	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	None	Max	C-Max
Walk Time (s)		7.0	7.0
Flash Dont Walk (s)	33.0	19.0	
Pedestrian Calls (#/hr)	0	0	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Stapley Drive Optimization

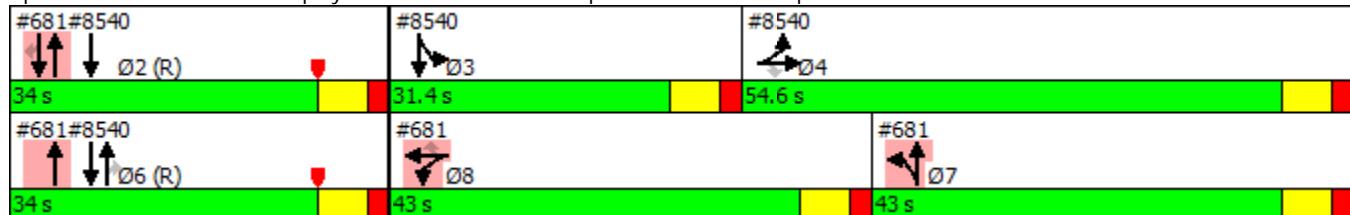
2040

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

AM Peak Hour

Queue shown is maximum after two cycles.

Splits and Phases: 681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp



Stapley Drive Optimization

2040

8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

AM Peak Hour

	→	→	→	←	←	↑	↑	↓	↓	←	→	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1					4	1	1	2	1
Traffic Volume (vph)	409	0	635	0	0	0	0	1292	366	386	1284	0
Future Volume (vph)	409	0	635	0	0	0	0	1292	366	386	1284	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	260		260	0			0	260		260	265	0
Storage Lanes	1		1	0			0	2		1	2	0
Taper Length (ft)	25			25				25			25	
Lane Util. Factor	0.95	0.91	0.95	1.00	1.00	1.00	1.00	0.81	1.00	0.97	0.91	1.00
Frt			0.870	0.850					0.850			
Flt Protected	0.950	0.993								0.950		
Satd. Flow (prot)	1681	1464	1504	0	0	0	0	7544	1583	3433	5085	0
Flt Permitted	0.950	0.993								0.950		
Satd. Flow (perm)	1681	1464	1504	0	0	0	0	7544	1583	3433	5085	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		91	91						398			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1281			1130			492			538	
Travel Time (s)		29.1			25.7			11.2			12.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	445	0	690	0	0	0	0	1404	398	420	1396	0
Shared Lane Traffic (%)	11%		47%									
Lane Group Flow (vph)	396	373	366	0	0	0	0	1404	398	420	1396	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1					2	1	1	2	
Detector Template	Left	Thru	Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20					100	20	20	100	
Trailing Detector (ft)	0	0	0					0	0	0	0	
Detector 1 Position(ft)	0	0	0					0	0	0	0	
Detector 1 Size(ft)	20	6	20					6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94				94			94			
Detector 2 Size(ft)		6				6			6			
Detector 2 Type		Cl+Ex						Cl+Ex		Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0		0.0		
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	4	4						6		3	2 3 6	
Permitted Phases		4						6				

Lane Group	Ø2	Ø7	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	2	7	8
Permitted Phases			

Stapley Drive Optimization

2040

8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4					6	6	3	2	3
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0					15.0	15.0	10.0		
Minimum Split (s)	46.5	46.5	46.5					32.5	32.5	16.5		
Total Split (s)	54.6	54.6	54.6					34.0	34.0	31.4		
Total Split (%)	45.5%	45.5%	45.5%					28.3%	28.3%	26.2%		
Maximum Green (s)	48.1	48.1	48.1					27.5	27.5	24.9		
Yellow Time (s)	4.5	4.5	4.5					4.5	4.5	4.5		
All-Red Time (s)	2.0	2.0	2.0					2.0	2.0	2.0		
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5					6.5	6.5	6.5		
Lead/Lag	Lag	Lag	Lag								Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0		
Recall Mode	Max	Max	Max					C-Max	C-Max	None		
Walk Time (s)	7.0	7.0	7.0					7.0	7.0			
Flash Dont Walk (s)	33.0	33.0	33.0					19.0	19.0			
Pedestrian Calls (#/hr)	0	0	0					0	0			
Act Effct Green (s)	48.3	48.3	48.3					27.5	27.5	24.7	58.7	
Actuated g/C Ratio	0.40	0.40	0.40					0.23	0.23	0.21	0.49	
v/c Ratio	0.59	0.58	0.56					0.81	0.59	0.59	0.56	
Control Delay	32.5	25.0	24.1					48.3	7.8	34.5	13.3	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.5	
Total Delay	32.5	25.0	24.1					48.3	7.8	34.5	13.8	
LOS	C	C	C					D	A	C	B	
Approach Delay		27.3						39.3			18.6	
Approach LOS		C						D			B	
Queue Length 50th (ft)	249	184	169					256	0	151	95	
Queue Length 95th (ft)	361	297	273					293	85	m196	120	
Internal Link Dist (ft)		1201		1050				412			458	
Turn Bay Length (ft)	260		260					260	265			
Base Capacity (vph)	675	643	659					1728	669	712	2495	
Starvation Cap Reductn	0	0	0					0	0	0	597	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.59	0.58	0.56					0.81	0.59	0.59	0.74	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 28.5

Intersection LOS: C

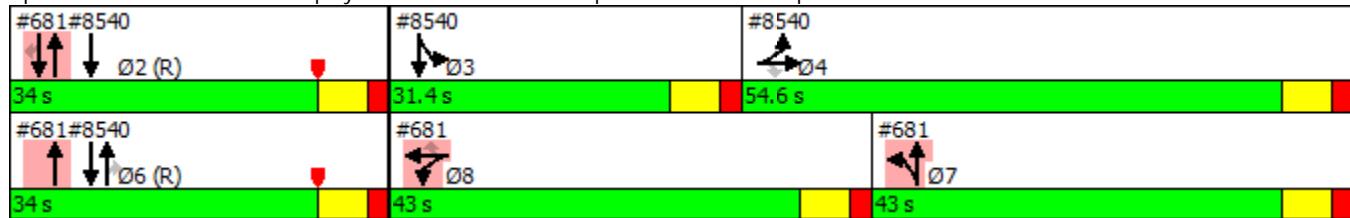
Intersection Capacity Utilization 91.8%

ICU Level of Service F

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp



Lane Group	Ø2	Ø7	Ø8
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	10.0	10.0
Minimum Split (s)	26.5	16.5	46.5
Total Split (s)	34.0	43.0	43.0
Total Split (%)	28%	36%	36%
Maximum Green (s)	27.5	36.5	36.5
Yellow Time (s)	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	C-Max	None	Max
Walk Time (s)	7.0		7.0
Flash Dont Walk (s)	13.0		33.0
Pedestrian Calls (#/hr)	0		0
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Stapley Drive Optimization

2040

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

PM Peak Hour

	→	→	→	←	←	↑	↑	↓	↓	←	→	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↑	↑	↑	↑↑	↑↑↑		↑↑↑↑	↑↑↑↑	↑
Traffic Volume (vph)	0	0	0	435	4	471	656	1482	0	0	1188	585
Future Volume (vph)	0	0	0	435	4	471	656	1482	0	0	1188	585
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	265		265	260		0	250		250
Storage Lanes	0		0	1		1	2		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	0.97	0.91	1.00	1.00	0.81	1.00
Fr _t					0.910	0.850						0.850
Flt Protected					0.950	0.981		0.950				
Satd. Flow (prot)	0	0	0	1681	1513	1504	3433	5085	0	0	7544	1583
Flt Permitted					0.950	0.981		0.950				
Satd. Flow (perm)	0	0	0	1681	1513	1504	3433	5085	0	0	7544	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					28	91						510
Link Speed (mph)		30			30		30				30	
Link Distance (ft)		1284			1162		538				373	
Travel Time (s)		29.2			26.4		12.2				8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	473	4	512	713	1611	0	0	1291	636
Shared Lane Traffic (%)				27%		39%						
Lane Group Flow (vph)	0	0	0	345	332	312	713	1611	0	0	1291	636
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12		24				24	
Link Offset(ft)		0			0		0				0	
Crosswalk Width(ft)		16			16		16				16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2	1	1	2			2	1
Detector Template				Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)				20	100	20	20	100			100	20
Trailing Detector (ft)				0	0	0	0	0			0	0
Detector 1 Position(ft)				0	0	0	0	0			0	0
Detector 1 Size(ft)				20	6	20	20	6			6	20
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94		94				94	
Detector 2 Size(ft)					6		6				6	
Detector 2 Type					Cl+Ex		Cl+Ex				Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0		0.0				0.0	
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				8	8		7	2 6 7			2	
Permitted Phases					8						2	

Lane Group	Ø3	Ø4	Ø6
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	3	4	6
Permitted Phases			

Stapley Drive Optimization

2040

681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8	8	7	2 6 7			2	2
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	10.0				15.0	15.0
Minimum Split (s)				46.5	46.5	46.5	16.5				26.5	26.5
Total Split (s)				42.0	42.0	42.0	41.0				37.0	37.0
Total Split (%)				35.0%	35.0%	35.0%	34.2%				30.8%	30.8%
Maximum Green (s)				35.5	35.5	35.5	34.5				30.5	30.5
Yellow Time (s)				4.5	4.5	4.5	4.5				4.5	4.5
All-Red Time (s)				2.0	2.0	2.0	2.0				2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0				0.0	0.0
Total Lost Time (s)				6.5	6.5	6.5	6.5				6.5	6.5
Lead/Lag				Lead	Lead	Lead	Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0				3.0	3.0
Recall Mode				Max	Max	Max	None				C-Max	C-Max
Walk Time (s)				7.0	7.0	7.0					7.0	7.0
Flash Dont Walk (s)				33.0	33.0	33.0					13.0	13.0
Pedestrian Calls (#/hr)				0	0	0					0	0
Act Effct Green (s)				35.5	35.5	35.5	34.5	71.5			30.5	30.5
Actuated g/C Ratio				0.30	0.30	0.30	0.29	0.60			0.25	0.25
v/c Ratio				0.69	0.71	0.61	0.72	0.53			0.67	0.81
Control Delay				46.0	44.0	31.2	53.9	13.1			28.8	21.2
Queue Delay				0.0	0.0	0.0	0.0	0.2			0.0	0.0
Total Delay				46.0	44.0	31.2	53.9	13.3			28.8	21.2
LOS				D	D	C	D	B			C	C
Approach Delay						40.7		25.7			26.3	
Approach LOS						D		C			C	
Queue Length 50th (ft)				249	231	154	274	155			235	327
Queue Length 95th (ft)				364	353	261	m329	m199			226	455
Internal Link Dist (ft)	1204				1082			458			293	
Turn Bay Length (ft)				265		265	260				250	
Base Capacity (vph)				497	467	509	986	3029			1917	782
Starvation Cap Reductn				0	0	0	0	547			0	0
Spillback Cap Reductn				0	0	2	0	149			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.69	0.71	0.62	0.72	0.65			0.67	0.81

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NSSB and 6:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 28.7

Intersection LOS: C

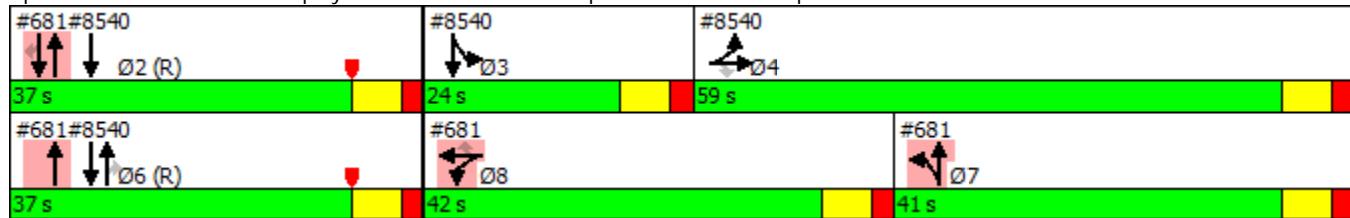
Intersection Capacity Utilization 97.3%

ICU Level of Service F

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 681: Stapley Dr & WB US 60 On Ramp/WB US 60 Off Ramp



Lane Group	Ø3	Ø4	Ø6
Detector Phase			
Switch Phase			
Minimum Initial (s)	10.0	10.0	15.0
Minimum Split (s)	16.5	46.5	32.5
Total Split (s)	24.0	59.0	37.0
Total Split (%)	20%	49%	31%
Maximum Green (s)	17.5	52.5	30.5
Yellow Time (s)	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	None	Max	C-Max
Walk Time (s)		7.0	7.0
Flash Dont Walk (s)	33.0	19.0	
Pedestrian Calls (#/hr)	0	0	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2040

PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↑	↑↑	↑↑	↑	↑↑	↑↑↑		↑↑	↑↑↑	
Traffic Volume (vph)	197	829	159	218	651	115	232	1226	240	203	1242	121
Future Volume (vph)	197	829	159	218	651	115	232	1226	240	203	1242	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		150	188		0	195		180	195		0
Storage Lanes	2		1	2		1	2		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	0.91	0.97	0.91	0.91
Fr _t			0.850			0.850		0.975			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	4958	0	3433	5019	0
Flt Permitted	0.166			0.124			0.950			0.950		
Satd. Flow (perm)	600	3539	1583	448	3539	1583	3433	4958	0	3433	5019	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			105			125		40			16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			369			2333	
Travel Time (s)		61.7			59.7			8.4			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	214	901	173	237	708	125	252	1333	261	221	1350	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	214	901	173	237	708	125	252	1594	0	221	1482	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex								
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94		94		
Detector 2 Size(ft)		6			6			6		6		
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex		Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0		0.0		
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2						

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2040
PM Peak Hour

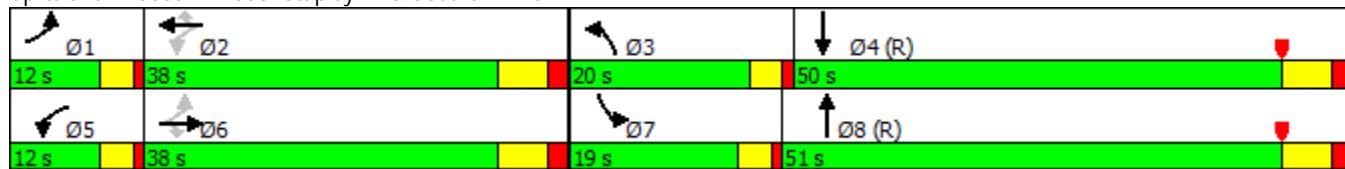


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2	2	3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0	15.0	8.0	15.0		8.0	15.0	
Minimum Split (s)	12.0	33.0	33.0	12.0	28.0	28.0	12.0	28.0		12.0	30.0	
Total Split (s)	12.0	38.0	38.0	12.0	38.0	38.0	20.0	51.0		19.0	50.0	
Total Split (%)	10.0%	31.7%	31.7%	10.0%	31.7%	31.7%	16.7%	42.5%		15.8%	41.7%	
Maximum Green (s)	8.0	31.5	31.5	8.0	31.5	31.5	16.0	44.5		15.0	43.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5		3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0	6.5	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max	Max	None	Max	Max	None	C-Min		None	C-Min	
Act Effect Green (s)	42.7	34.7	32.2	42.8	34.8	32.3	13.7	48.6		12.7	47.5	
Actuated g/C Ratio	0.36	0.29	0.27	0.36	0.29	0.27	0.11	0.40		0.11	0.40	
v/c Ratio	0.53	0.88	0.35	0.66	0.69	0.24	0.64	0.79		0.61	0.74	
Control Delay	29.4	52.1	16.8	33.9	42.3	7.2	58.1	24.1		58.5	33.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	29.4	52.1	16.8	33.9	42.3	7.2	58.1	24.1		58.5	33.6	
LOS	C	D	B	C	D	A	E	C		E	C	
Approach Delay		43.6			36.3			28.8			36.8	
Approach LOS		D			D			C			D	
Queue Length 50th (ft)	55	353	41	61	258	0	86	449		85	349	
Queue Length 95th (ft)	82	#468	103	98	328	47	129	442		125	419	
Internal Link Dist (ft)		2634			2548			289			2253	
Turn Bay Length (ft)	198		150	188			195			195		
Base Capacity (vph)	402	1023	501	359	1024	516	457	2030		429	1998	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.53	0.88	0.35	0.66	0.69	0.24	0.55	0.79		0.52	0.74	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	30 (25%), Referenced to phase 4:SBT and 8:NBT, Start of Yellow
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.88
Intersection Signal Delay:	35.7
Intersection Capacity Utilization	78.6%
Analysis Period (min)	15
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

2040

PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↓	↑	↑	↓	↑	↑	↑↓	↑	↑	↑↓	↑
Traffic Volume (vph)	47	0	81	71	0	27	53	1600	67	25	1652	37
Future Volume (vph)	47	0	81	71	0	27	53	1600	67	25	1652	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		0	140		0	80		0	90		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Fr _t			0.850			0.850		0.994			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	0	1583	1770	0	1583	1770	3518	0	1770	3529	0
Flt Permitted	0.950			0.950			0.082			0.086		
Satd. Flow (perm)	1770	0	1583	1770	0	1583	153	3518	0	160	3529	0
Right Turn on Red			Yes			Yes			No		No	
Satd. Flow (RTOR)			81			45						
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		497			563			419			1419	
Travel Time (s)		7.5			8.5			9.5			32.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	0	88	77	0	29	58	1739	73	27	1796	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	0	88	77	0	29	58	1812	0	27	1836	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1		1	1	2		1	2	
Detector Template	Left		Right	Left		Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20		20	20		20	20	100		20	100	
Trailing Detector (ft)	0		0	0		0	0	0		0	0	
Detector 1 Position(ft)	0		0	0		0	0	0		0	0	
Detector 1 Size(ft)	20		20	20		20	20	6		20	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Perm		Perm	Perm		Perm	Perm	NA		Perm	NA	
Protected Phases								2			2	
Permitted Phases	3		3	4		4	2			2		

Stapley Drive Optimization
8325: Stapley Dr & Hilton Avenue

2040
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	3			3	4		4	2	2	2	2	
Switch Phase												
Minimum Initial (s)	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	15.0		15.0	15.0		15.0	20.0	20.0		20.0	20.0	
Total Split (s)	15.0		15.0	16.0		16.0	89.0	89.0		89.0	89.0	
Total Split (%)	12.5%		12.5%	13.3%		13.3%	74.2%	74.2%		74.2%	74.2%	
Maximum Green (s)	11.0		11.0	12.0		12.0	85.0	85.0		85.0	85.0	
Yellow Time (s)	3.5		3.5	3.5		3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5		0.5	0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead		Lead	Lag		Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0		3.0	3.0		3.0	3.0	3.0		3.0	3.0	
Recall Mode	None		None	None		None	C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	8.6		8.6	10.0		10.0	91.5	91.5		91.5	91.5	
Actuated g/C Ratio	0.07		0.07	0.08		0.08	0.76	0.76		0.76	0.76	
v/c Ratio	0.40		0.47	0.52		0.17	0.50	0.68		0.22	0.68	
Control Delay	62.0		21.6	65.1		9.1	32.8	18.7		6.3	11.7	
Queue Delay	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay	62.0		21.6	65.1		9.1	32.8	18.7		6.3	11.7	
LOS	E		C	E		A	C	B		A	B	
Approach Delay	36.4				49.8			19.2				11.6
Approach LOS	D				D			B				B
Queue Length 50th (ft)	38		5	58		0	27	458		1	640	
Queue Length 95th (ft)	79		56	108		18	m86	767		m5	771	
Internal Link Dist (ft)	417				483			339				1339
Turn Bay Length (ft)	80			140			80					90
Base Capacity (vph)	162		218	177		199	116	2682		122	2690	
Starvation Cap Reductn	0		0	0		0	0	0		0	0	
Spillback Cap Reductn	0		0	0		0	0	0		0	0	
Storage Cap Reductn	0		0	0		0	0	0		0	0	
Reduced v/c Ratio	0.31		0.40	0.44		0.15	0.50	0.68		0.22	0.68	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 17.0

Intersection LOS: B

Intersection Capacity Utilization 65.8%

ICU Level of Service C

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8325: Stapley Dr & Hilton Avenue



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AZTEC Engineering

Synchro 9 Report

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Stapley Drive Optimization

2040

8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

PM Peak Hour

	→	→	→	←	←	↑	↑	↓	↓	←	→	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1					4	1	1	1	1
Traffic Volume (vph)	601	7	1047	0	0	0	0	1531	687	386	1199	0
Future Volume (vph)	601	7	1047	0	0	0	0	1531	687	386	1199	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	260		260	0			0	260		260	265	0
Storage Lanes	1		1	0			0	2		1	2	0
Taper Length (ft)	25			25				25			25	
Lane Util. Factor	0.95	0.91	0.95	1.00	1.00	1.00	1.00	0.81	1.00	0.97	0.91	1.00
Fr _t			0.868	0.850					0.850			
Flt Protected	0.950	0.995								0.950		
Satd. Flow (prot)	1681	1464	1504	0	0	0	0	7544	1583	3433	5085	0
Flt Permitted	0.950	0.995								0.950		
Satd. Flow (perm)	1681	1464	1504	0	0	0	0	7544	1583	3433	5085	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22	91						747			
Link Speed (mph)		30		30			30			30		
Link Distance (ft)		1281		1130			492			538		
Travel Time (s)		29.1		25.7			11.2			12.2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	653	8	1138	0	0	0	0	1664	747	420	1303	0
Shared Lane Traffic (%)	10%		47%									
Lane Group Flow (vph)	588	608	603	0	0	0	0	1664	747	420	1303	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12		12			24			24		
Link Offset(ft)		0		0			0			0		
Crosswalk Width(ft)		16		16			16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1					2	1	1	2	
Detector Template	Left	Thru	Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20					100	20	20	100	
Trailing Detector (ft)	0	0	0					0	0	0	0	
Detector 1 Position(ft)	0	0	0					0	0	0	0	
Detector 1 Size(ft)	20	6	20					6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94				94			94			
Detector 2 Size(ft)		6				6			6			
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	4	4						6		3	2 3 6	
Permitted Phases		4						6				

Lane Group	Ø2	Ø7	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	2	7	8
Permitted Phases			

Stapley Drive Optimization

2040

8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4					6	6	3	2	3 6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0					15.0	15.0	10.0		
Minimum Split (s)	46.5	46.5	46.5					32.5	32.5	16.5		
Total Split (s)	59.0	59.0	59.0					37.0	37.0	24.0		
Total Split (%)	49.2%	49.2%	49.2%					30.8%	30.8%	20.0%		
Maximum Green (s)	52.5	52.5	52.5					30.5	30.5	17.5		
Yellow Time (s)	4.5	4.5	4.5					4.5	4.5	4.5		
All-Red Time (s)	2.0	2.0	2.0					2.0	2.0	2.0		
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5					6.5	6.5	6.5		
Lead/Lag	Lag	Lag	Lag								Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0		
Recall Mode	Max	Max	Max					C-Max	C-Max	None		
Walk Time (s)	7.0	7.0	7.0					7.0	7.0			
Flash Dont Walk (s)	33.0	33.0	33.0					19.0	19.0			
Pedestrian Calls (#/hr)	0	0	0					0	0			
Act Effct Green (s)	52.5	52.5	52.5					30.5	30.5	17.5	54.5	
Actuated g/C Ratio	0.44	0.44	0.44					0.25	0.25	0.15	0.45	
v/c Ratio	0.80	0.93	0.85					0.87	0.78	0.84	0.56	
Control Delay	39.1	53.9	38.6					48.7	9.2	48.4	13.2	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.3	
Total Delay	39.1	53.9	38.6					48.7	9.2	48.4	13.6	
LOS	D	D	D					D	A	D	B	
Approach Delay		43.9						36.4			22.0	
Approach LOS		D						D			C	
Queue Length 50th (ft)	406	469	377					305	0	170	83	
Queue Length 95th (ft)	573	#736	#613					345	125	#246	100	
Internal Link Dist (ft)		1201		1050				412			458	
Turn Bay Length (ft)	260		260					260	265			
Base Capacity (vph)	735	652	709					1917	959	500	2309	
Starvation Cap Reductn	0	0	0					0	0	0	429	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.80	0.93	0.85					0.87	0.78	0.84	0.69	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 34.5

Intersection LOS: C

Intersection Capacity Utilization 97.3%

ICU Level of Service F

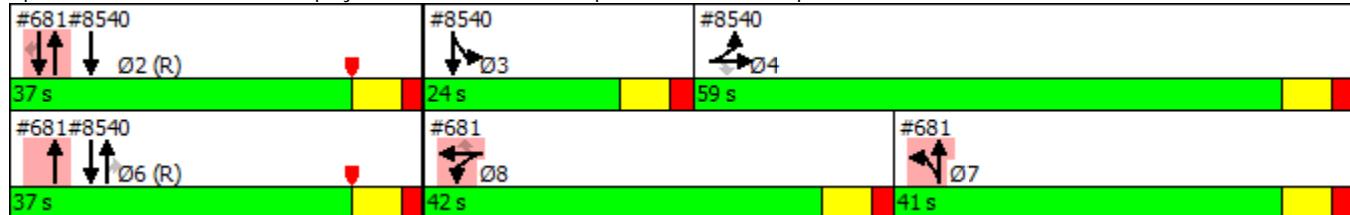
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Lane Group	Ø2	Ø7	Ø8
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	10.0	10.0
Minimum Split (s)	26.5	16.5	46.5
Total Split (s)	37.0	41.0	42.0
Total Split (%)	31%	34%	35%
Maximum Green (s)	30.5	34.5	35.5
Yellow Time (s)	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	C-Max	None	Max
Walk Time (s)	7.0		7.0
Flash Dont Walk (s)	13.0		33.0
Pedestrian Calls (#/hr)	0		0
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Queue shown is maximum after two cycles.

Splits and Phases: 8540: Stapley Dr & EB US 60 Off Ramp/EB US 60 On Ramp



Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

2020 Vol./3 NB_SB Through Lanes, 1 EBRT Lane
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑		↑	↑↑	↑	↑	↑↑↑	
Traffic Volume (vph)	117	472	118	205	917	72	203	787	116	102	919	135
Future Volume (vph)	117	472	118	205	917	72	203	787	116	102	919	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	0.91
Fr _t			0.850		0.989				0.850		0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3500	0	1770	5085	1583	1770	4989	0
Flt Permitted	0.135			0.306			0.133			0.239		
Satd. Flow (perm)	251	3539	1583	570	3500	0	248	5085	1583	445	4989	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			128		9				126		27	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			879			941	
Travel Time (s)		61.7			59.7			20.0			21.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	127	513	128	223	997	78	221	855	126	111	999	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	127	513	128	223	1075	0	221	855	126	111	1146	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane	Yes			Yes								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type	Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2			8		8	4		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		12.0	28.5	28.5	12.0	30.5	
Total Split (s)	12.0	35.0	35.0	16.0	39.0		16.0	37.0	37.0	12.0	33.0	
Total Split (%)	12.0%	35.0%	35.0%	16.0%	39.0%		16.0%	37.0%	37.0%	12.0%	33.0%	
Maximum Green (s)	8.0	28.5	28.5	12.0	32.5		12.0	30.5	30.5	8.0	26.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Min	C-Min	None	C-Min	
Walk Time (s)		4.0	4.0		4.0			4.0	4.0		4.0	
Flash Dont Walk (s)		23.0	23.0		18.0			18.0	18.0		20.0	
Pedestrian Calls (#/hr)	0	0		0				0	0		0	
Act Effct Green (s)	40.2	32.2	29.7	46.7	35.4		44.1	32.6	32.6	37.0	29.0	
Actuated g/C Ratio	0.40	0.32	0.30	0.47	0.35		0.44	0.33	0.33	0.37	0.29	
v/c Ratio	0.57	0.45	0.23	0.56	0.86		0.78	0.52	0.21	0.41	0.78	
Control Delay	27.2	28.8	6.1	21.8	38.6		39.2	28.6	5.3	21.5	36.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	27.2	28.8	6.1	21.8	38.6		39.2	28.6	5.3	21.5	36.3	
LOS	C	C	A	C	D		D	C	A	C	D	
Approach Delay		24.8			35.7			28.1			35.0	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)	45	137	0	83	331		86	159	0	40	239	
Queue Length 95th (ft)	84	187	42	134	#450		#190	200	39	74	293	
Internal Link Dist (ft)		2634			2548			799			861	
Turn Bay Length (ft)	198		200	188			195		180	195		
Base Capacity (vph)	222	1140	560	414	1245		293	1678	606	270	1465	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.57	0.45	0.23	0.54	0.86		0.75	0.51	0.21	0.41	0.78	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 31.6

Intersection LOS: C

Intersection Capacity Utilization 79.7%

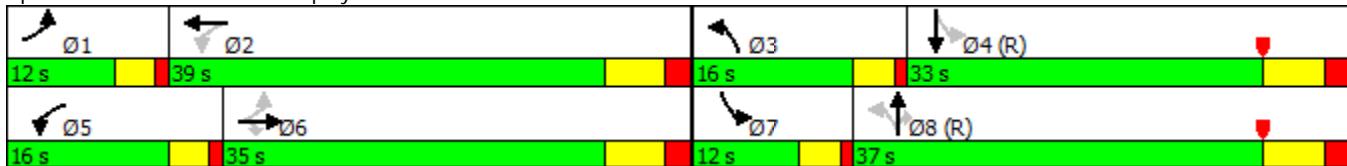
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2020 Vol./3 NB_SB Through Lanes, 1 EBRT Lane
PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑		↑	↑↑↑	↑	↑	↑↑↑	
Traffic Volume (vph)	170	714	137	188	561	99	200	1056	207	175	1069	104
Future Volume (vph)	170	714	137	188	561	99	200	1056	207	175	1069	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	0.91
Fr _t			0.850		0.977				0.850		0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3458	0	1770	5085	1583	1770	5019	0
Flt Permitted	0.178			0.134			0.107			0.132		
Satd. Flow (perm)	332	3539	1583	250	3458	0	199	5085	1583	246	5019	0
Right Turn on Red		Yes				Yes			Yes			Yes
Satd. Flow (RTOR)		143			18				222		16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			959			871	
Travel Time (s)		61.7			59.7			21.8			19.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	776	149	204	610	108	217	1148	225	190	1162	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	185	776	149	204	718	0	217	1148	225	190	1275	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane	Yes			Yes								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type	Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2			8		8	4		

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2020 Vol./3 NB_SB Through Lanes, 1 EBRT Lane
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		12.0	28.5	28.5	12.0	30.5	
Total Split (s)	15.0	34.0	34.0	17.0	36.0		18.0	43.0	43.0	16.0	41.0	
Total Split (%)	13.6%	30.9%	30.9%	15.5%	32.7%		16.4%	39.1%	39.1%	14.5%	37.3%	
Maximum Green (s)	11.0	27.5	27.5	13.0	29.5		14.0	36.5	36.5	12.0	34.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Max	C-Max	None	C-Max	
Walk Time (s)		4.0	4.0		4.0			4.0	4.0		4.0	
Flash Dont Walk (s)	23.0	23.0			18.0			18.0	18.0		20.0	
Pedestrian Calls (#/hr)	0	0			0			0	0		0	
Act Effct Green (s)	41.4	30.8	28.3	44.6	32.4		52.6	39.9	39.9	49.4	38.3	
Actuated g/C Ratio	0.38	0.28	0.26	0.41	0.29		0.48	0.36	0.36	0.45	0.35	
v/c Ratio	0.70	0.78	0.29	0.76	0.70		0.79	0.62	0.31	0.72	0.73	
Control Delay	36.4	43.3	7.8	41.6	37.9		43.4	30.8	4.7	35.7	34.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	36.4	43.3	7.8	41.6	37.9		43.4	30.8	4.7	35.7	34.0	
LOS	D	D	A	D	D		D	C	A	D	C	
Approach Delay		37.4			38.7			28.9			34.2	
Approach LOS		D			D			C			C	
Queue Length 50th (ft)	82	268	3	91	232		93	245	1	73	287	
Queue Length 95th (ft)	#149	343	54	#185	300		#200	294	52	#158	343	
Internal Link Dist (ft)		2634			2548			879			791	
Turn Bay Length (ft)	198		200	188			195		180	195		
Base Capacity (vph)	269	992	514	282	1031		296	1844	715	278	1758	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.69	0.78	0.29	0.72	0.70		0.73	0.62	0.31	0.68	0.73	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 34.0

Intersection LOS: C

Intersection Capacity Utilization 77.5%

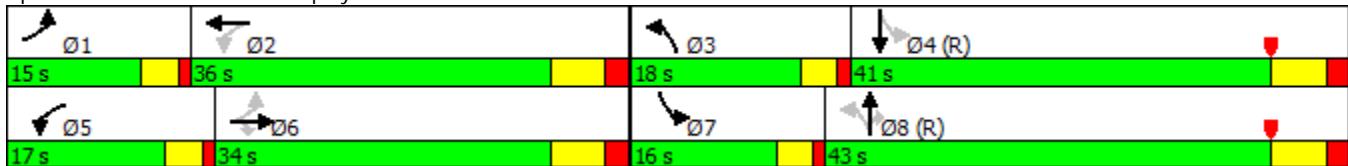
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

2030 Vol./3 NB_SB Through Lanes, 1 EBRT Lane
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑		↑	↑↑	↑	↑	↑↑↑	
Traffic Volume (vph)	127	509	128	221	988	78	219	848	125	110	990	145
Future Volume (vph)	127	509	128	221	988	78	219	848	125	110	990	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	0.91
Fr _t			0.850		0.989				0.850		0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3500	0	1770	5085	1583	1770	4989	0
Flt Permitted	0.134			0.285			0.134			0.197		
Satd. Flow (perm)	250	3539	1583	531	3500	0	250	5085	1583	367	4989	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139		9				136		28	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			879			941	
Travel Time (s)		61.7			59.7			20.0			21.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	553	139	240	1074	85	238	922	136	120	1076	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	138	553	139	240	1159	0	238	922	136	120	1234	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2			8		8	4		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		12.0	28.5	28.5	12.0	30.5	
Total Split (s)	12.0	36.0	36.0	15.0	39.0		15.0	36.0	36.0	13.0	34.0	
Total Split (%)	12.0%	36.0%	36.0%	15.0%	39.0%		15.0%	36.0%	36.0%	13.0%	34.0%	
Maximum Green (s)	8.0	29.5	29.5	11.0	32.5		11.0	29.5	29.5	9.0	27.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Min	C-Min	None	C-Min	
Walk Time (s)		4.0	4.0		4.0			4.0	4.0		4.0	
Flash Dont Walk (s)		23.0	23.0		18.0			18.0	18.0		20.0	
Pedestrian Calls (#/hr)	0	0		0				0	0		0	
Act Effct Green (s)	40.4	32.4	29.9	45.8	35.1		43.3	32.3	32.3	38.5	29.9	
Actuated g/C Ratio	0.40	0.32	0.30	0.46	0.35		0.43	0.32	0.32	0.38	0.30	
v/c Ratio	0.62	0.48	0.24	0.64	0.94		0.87	0.56	0.23	0.46	0.82	
Control Delay	29.8	28.9	5.8	25.1	46.7		51.8	29.7	5.4	22.5	37.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	29.8	28.9	5.8	25.1	46.7		51.8	29.7	5.4	22.5	37.0	
LOS	C	C	A	C	D		D	C	A	C	D	
Approach Delay		25.2			43.0			31.2			35.7	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	49	148	0	91	371		94	177	0	44	260	
Queue Length 95th (ft)	#102	200	43	145	#512		#232	221	41	79	316	
Internal Link Dist (ft)		2634			2548			799			861	
Turn Bay Length (ft)	198		200	188			195		180	195		
Base Capacity (vph)	222	1148	570	381	1234		275	1640	603	269	1516	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.62	0.48	0.24	0.63	0.94		0.87	0.56	0.23	0.45	0.81	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 34.8

Intersection LOS: C

Intersection Capacity Utilization 84.7%

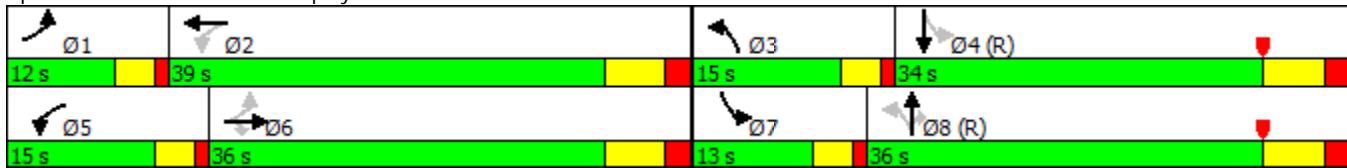
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2030 Vol./3 NB_SB Through Lanes, 1 EBRT Lane
PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑		↑	↑↑	↑	↑	↑↑↑	
Traffic Volume (vph)	183	769	148	202	604	107	215	1138	223	189	1152	112
Future Volume (vph)	183	769	148	202	604	107	215	1138	223	189	1152	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	0.91
Fr _t			0.850		0.977				0.850		0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3458	0	1770	5085	1583	1770	5019	0
Flt Permitted	0.139			0.138			0.106			0.113		
Satd. Flow (perm)	259	3539	1583	257	3458	0	197	5085	1583	210	5019	0
Right Turn on Red		Yes				Yes			Yes			Yes
Satd. Flow (RTOR)		145			18				225		16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			959			871	
Travel Time (s)		61.7			59.7			21.8			19.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	199	836	161	220	657	116	234	1237	242	205	1252	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	199	836	161	220	773	0	234	1237	242	205	1374	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane	Yes			Yes								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type	Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2			8		8	4		

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2030 Vol./3 NB_SB Through Lanes, 1 EBRT Lane
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		12.0	28.5	28.5	12.0	30.5	
Total Split (s)	16.0	35.0	35.0	16.0	35.0		18.0	44.0	44.0	15.0	41.0	
Total Split (%)	14.5%	31.8%	31.8%	14.5%	31.8%		16.4%	40.0%	40.0%	13.6%	37.3%	
Maximum Green (s)	12.0	28.5	28.5	12.0	28.5		14.0	37.5	37.5	11.0	34.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Max	C-Max	None	C-Max	
Walk Time (s)		4.0	4.0		4.0			4.0	4.0		4.0	
Flash Dont Walk (s)		23.0	23.0		18.0			18.0	18.0		20.0	
Pedestrian Calls (#/hr)	0	0		0				0	0		0	
Act Effct Green (s)	42.7	31.2	28.7	43.3	31.5		53.3	40.2	40.2	48.7	37.9	
Actuated g/C Ratio	0.39	0.28	0.26	0.39	0.29		0.48	0.37	0.37	0.44	0.34	
v/c Ratio	0.77	0.83	0.31	0.84	0.77		0.83	0.67	0.34	0.83	0.79	
Control Delay	43.2	45.6	8.7	51.3	41.4		48.4	31.5	5.5	51.9	36.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	43.2	45.6	8.7	51.3	41.4		48.4	31.5	5.5	51.9	36.3	
LOS	D	D	A	D	D		D	C	A	D	D	
Approach Delay		40.2			43.6			30.1			38.3	
Approach LOS		D			D			C			D	
Queue Length 50th (ft)	89	292	9	100	258		105	266	8	88	318	
Queue Length 95th (ft)	#190	370	60	#228	333		#229	317	60	#216	378	
Internal Link Dist (ft)		2634			2548			879			791	
Turn Bay Length (ft)	198		200	188			195		180	195		
Base Capacity (vph)	266	1003	520	266	1001		296	1857	720	249	1740	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.75	0.83	0.31	0.83	0.77		0.79	0.67	0.34	0.82	0.79	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 37.1

Intersection LOS: D

Intersection Capacity Utilization 82.4%

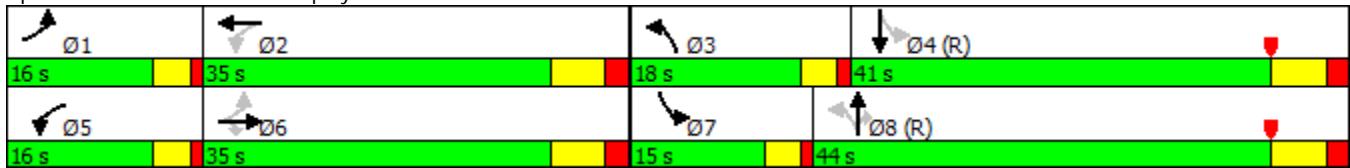
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

2040 Vol./3 NB_SB Through Lanes, 1 EBRT Lane
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑	↑↑	↑	↑↑↑	↑	↑	↑↑↑	↑
Traffic Volume (vph)	136	548	138	238	1065	84	236	914	135	118	1067	157
Future Volume (vph)	136	548	138	238	1065	84	236	914	135	118	1067	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	0.91
Fr _t			0.850		0.989				0.850		0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3500	0	1770	5085	1583	1770	4989	0
Flt Permitted	0.137			0.241			0.141			0.158		
Satd. Flow (perm)	255	3539	1583	449	3500	0	263	5085	1583	294	4989	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			169		9				169		27	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			879			941	
Travel Time (s)		61.7			59.7			20.0			21.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	596	150	259	1158	91	257	993	147	128	1160	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	148	596	150	259	1249	0	257	993	147	128	1331	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2			8		8	4		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		12.0	28.5	28.5	12.0	30.5	
Total Split (s)	12.0	34.4	34.4	18.0	40.4		15.0	34.6	34.6	13.0	32.6	
Total Split (%)	12.0%	34.4%	34.4%	18.0%	40.4%		15.0%	34.6%	34.6%	13.0%	32.6%	
Maximum Green (s)	8.0	27.9	27.9	14.0	33.9		11.0	28.1	28.1	9.0	26.1	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Min	C-Min	None	C-Min	
Walk Time (s)		4.0	4.0		4.0			4.0	4.0		4.0	
Flash Dont Walk (s)		23.0	23.0		18.0			18.0	18.0		20.0	
Pedestrian Calls (#/hr)	0	0		0				0	0		0	
Act Effct Green (s)	39.6	31.6	29.1	47.9	36.4		41.9	30.9	30.9	37.3	28.6	
Actuated g/C Ratio	0.40	0.32	0.29	0.48	0.36		0.42	0.31	0.31	0.37	0.29	
v/c Ratio	0.67	0.53	0.26	0.67	0.98		0.93	0.63	0.24	0.54	0.92	
Control Delay	33.4	30.6	4.5	25.1	52.1		63.8	31.9	3.9	26.4	45.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	33.4	30.6	4.5	25.1	52.1		63.8	31.9	3.9	26.4	45.4	
LOS	C	C	A	C	D		E	C	A	C	D	
Approach Delay		26.7			47.5			34.8			43.7	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	51	166	0	96	405		108	199	0	48	295	
Queue Length 95th (ft)	#120	222	36	151	#560		#262	246	33	86	#386	
Internal Link Dist (ft)		2634			2548			799			861	
Turn Bay Length (ft)	198		200	188			195		180	195		
Base Capacity (vph)	222	1118	580	402	1279		276	1571	605	243	1446	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.67	0.53	0.26	0.64	0.98		0.93	0.63	0.24	0.53	0.92	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 39.5

Intersection LOS: D

Intersection Capacity Utilization 90.2%

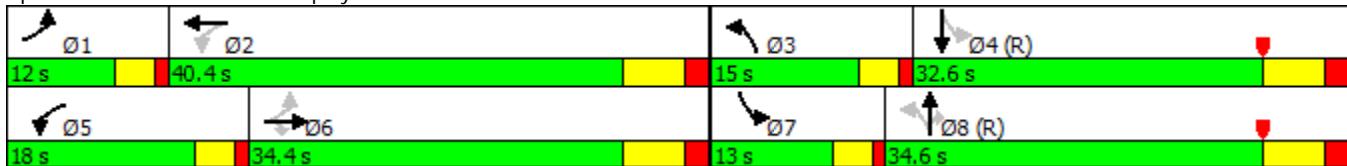
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2040 Vol./3 NB_SB Through Lanes, 1 EBRT Lane

PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑		↑	↑↑↑	↑	↑	↑↑↑	
Traffic Volume (vph)	197	829	159	218	651	115	232	1226	240	203	1242	121
Future Volume (vph)	197	829	159	218	651	115	232	1226	240	203	1242	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	0.91
Fr _t				0.850		0.977			0.850		0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3458	0	1770	5085	1583	1770	5019	0
Flt Permitted	0.140			0.136			0.109			0.112		
Satd. Flow (perm)	261	3539	1583	253	3458	0	203	5085	1583	209	5019	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			145			18			222			16
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			959			871	
Travel Time (s)		61.7			59.7			21.8			19.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	214	901	173	237	708	125	252	1333	261	221	1350	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	214	901	173	237	833	0	252	1333	261	221	1482	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane	Yes			Yes								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type	Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2			8		8	4		

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2040 Vol./3 NB_SB Through Lanes, 1 EBRT Lane

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		12.0	28.5	28.5	12.0	30.5	
Total Split (s)	15.0	35.0	35.0	16.0	36.0		17.0	43.0	43.0	16.0	42.0	
Total Split (%)	13.6%	31.8%	31.8%	14.5%	32.7%		15.5%	39.1%	39.1%	14.5%	38.2%	
Maximum Green (s)	11.0	28.5	28.5	12.0	29.5		13.0	36.5	36.5	12.0	35.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Max	C-Max	None	C-Max	
Walk Time (s)		4.0	4.0		4.0			4.0	4.0		4.0	
Flash Dont Walk (s)	23.0	23.0			18.0			18.0	18.0		20.0	
Pedestrian Calls (#/hr)	0	0			0			0	0		0	
Act Effct Green (s)	42.0	31.0	28.5	44.0	32.0		52.2	39.3	39.3	49.8	38.1	
Actuated g/C Ratio	0.38	0.28	0.26	0.40	0.29		0.47	0.36	0.36	0.45	0.35	
v/c Ratio	0.86	0.90	0.33	0.89	0.82		0.90	0.73	0.37	0.85	0.85	
Control Delay	54.8	51.6	10.0	59.3	43.2		60.1	33.8	7.0	52.6	38.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	54.8	51.6	10.0	59.3	43.2		60.1	33.8	7.0	52.6	38.6	
LOS	D	D	A	E	D		E	C	A	D	D	
Approach Delay		46.5			46.8			33.6			40.4	
Approach LOS		D			D			C			D	
Queue Length 50th (ft)	96	322	15	110	282		122	298	18	98	349	
Queue Length 95th (ft)	#228	#438	70	#256	360		#272	354	76	#230	412	
Internal Link Dist (ft)		2634			2548			879			791	
Turn Bay Length (ft)	198		200	188			195		180	195		
Base Capacity (vph)	250	997	517	266	1018		281	1815	707	265	1748	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.86	0.90	0.33	0.89	0.82		0.90	0.73	0.37	0.83	0.85	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 40.8

Intersection LOS: D

Intersection Capacity Utilization 87.9%

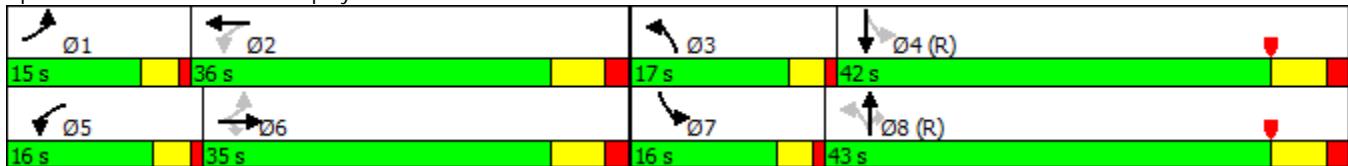
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

2020 Vol./RT Lane At All Approaches

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	472	118	205	917	72	203	787	116	102	919	135
Future Volume (vph)	117	472	118	205	917	72	203	787	116	102	919	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		200	195		180	195		200
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Fr _t			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.134			0.337			0.121			0.165		
Satd. Flow (perm)	250	3539	1583	628	3539	1583	225	3539	1583	307	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			128			125			126			132
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			1788			2333	
Travel Time (s)		61.7			59.7			40.6			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	127	513	128	223	997	78	221	855	126	111	999	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	127	513	128	223	997	78	221	855	126	111	999	147
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right									
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex											
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm									
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4

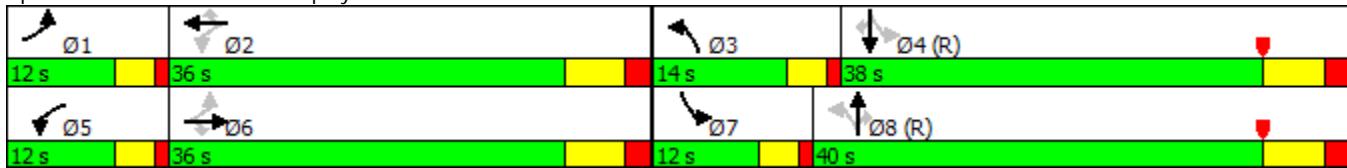
Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

2020 Vol./RT Lane At All Approaches
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4						
Switch Phase																		
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0	15.0	8.0	15.0	15.0	8.0	15.0	15.0						
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5	28.5	12.0	28.5	28.5	12.0	30.5	30.5						
Total Split (s)	12.0	36.0	36.0	12.0	36.0	36.0	14.0	40.0	40.0	12.0	38.0	38.0						
Total Split (%)	12.0%	36.0%	36.0%	12.0%	36.0%	36.0%	14.0%	40.0%	40.0%	12.0%	38.0%	38.0%						
Maximum Green (s)	8.0	29.5	29.5	8.0	29.5	29.5	10.0	33.5	33.5	8.0	31.5	31.5						
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5						
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0						
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5	0.0	0.0	-2.5	-2.5	0.0	-2.5	0.0						
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0	6.5	4.0	4.0	4.0	4.0	4.0	6.5						
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?																		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0						
Recall Mode	None	Max	Max	None	Max	Max	None	C-Min	C-Min	None	C-Min	C-Min						
Walk Time (s)		4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0						
Flash Dont Walk (s)	23.0	23.0		18.0	18.0		18.0	18.0		20.0	20.0							
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0							
Act Effct Green (s)	40.3	32.3	29.8	40.7	32.5	30.0	45.5	35.5	35.5	41.5	33.5	31.0						
Actuated g/C Ratio	0.40	0.32	0.30	0.41	0.32	0.30	0.46	0.36	0.36	0.42	0.34	0.31						
v/c Ratio	0.57	0.45	0.23	0.64	0.87	0.14	0.86	0.68	0.20	0.45	0.84	0.25						
Control Delay	27.7	28.4	6.0	28.6	41.4	1.9	51.5	30.6	4.8	21.1	38.6	7.0						
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
Total Delay	27.7	28.4	6.0	28.6	41.4	1.9	51.5	30.6	4.8	21.1	38.6	7.0						
LOS	C	C	A	C	D	A	D	C	A	C	D	A						
Approach Delay		24.6			36.8			31.8			33.3							
Approach LOS		C			D			C			C							
Queue Length 50th (ft)	48	135	0	89	314	0	83	238	0	38	305	7						
Queue Length 95th (ft)	85	184	42	143	#429	11	#215	307	37	70	388	50						
Internal Link Dist (ft)		2634			2548			1708			2253							
Turn Bay Length (ft)	198		200	188		200	195		180	195		200						
Base Capacity (vph)	222	1143	562	348	1150	562	257	1274	650	244	1203	589						
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0						
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0						
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0						
Reduced v/c Ratio	0.57	0.45	0.23	0.64	0.87	0.14	0.86	0.67	0.19	0.45	0.83	0.25						
Intersection Summary																		
Area Type:	Other																	
Cycle Length: 100																		
Actuated Cycle Length: 100																		
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBT, Start of Yellow																		
Natural Cycle: 90																		
Control Type: Actuated-Coordinated																		
Maximum v/c Ratio: 0.87																		
Intersection Signal Delay: 32.4	Intersection LOS: C																	
Intersection Capacity Utilization 82.0%	ICU Level of Service D																	
Analysis Period (min) 15																		
# 95th percentile volume exceeds capacity, queue may be longer.																		

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2020 Vol./RT Lane At All Approaches

PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑	↑	↑	↑↑	↑	↑	↑↑	↑
Traffic Volume (vph)	170	714	137	188	561	99	200	1056	207	175	1069	104
Future Volume (vph)	170	714	137	188	561	99	200	1056	207	175	1069	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		200	195		180	195		200
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.216			0.147			0.098			0.099		
Satd. Flow (perm)	402	3539	1583	274	3539	1583	183	3539	1583	184	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			143			114			163			114
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			1788			2333	
Travel Time (s)		61.7			59.7			40.6			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	776	149	204	610	108	217	1148	225	190	1162	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	185	776	149	204	610	108	217	1148	225	190	1162	113
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right									
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex											
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm									
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2020 Vol./RT Lane At All Approaches

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0	15.0	8.0	15.0	15.0	8.0	15.0	15.0
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5	28.5	12.0	28.5	28.5	12.0	30.5	30.5
Total Split (s)	14.0	33.6	33.6	14.0	33.6	33.6	16.0	46.4	46.4	16.0	46.4	46.4
Total Split (%)	12.7%	30.5%	30.5%	12.7%	30.5%	30.5%	14.5%	42.2%	42.2%	14.5%	42.2%	42.2%
Maximum Green (s)	10.0	27.1	27.1	10.0	27.1	27.1	12.0	39.9	39.9	12.0	39.9	39.9
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5	0.0	0.0	-2.5	-2.5	0.0	-2.5	0.0
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0	6.5	4.0	4.0	4.0	4.0	4.0	6.5
Lead/Lag	Lead	Lag	Lag									
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0
Flash Dont Walk (s)	23.0	23.0			18.0	18.0		18.0	18.0		20.0	20.0
Pedestrian Calls (#/hr)	0	0			0	0		0	0		0	0
Act Effct Green (s)	39.4	29.6	27.1	39.8	29.8	27.3	55.0	43.3	43.3	53.8	42.8	40.3
Actuated g/C Ratio	0.36	0.27	0.25	0.36	0.27	0.25	0.50	0.39	0.39	0.49	0.39	0.37
v/c Ratio	0.70	0.82	0.30	0.87	0.64	0.23	0.84	0.82	0.31	0.76	0.84	0.17
Control Delay	38.1	45.7	8.0	59.2	39.0	6.8	51.5	36.2	8.4	41.9	37.7	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	45.7	8.0	59.2	39.0	6.8	51.5	36.2	8.4	41.9	37.7	5.0
LOS	D	D	A	E	D	A	D	D	A	D	D	A
Approach Delay		39.4				39.7						35.7
Approach LOS		D				D			C			D
Queue Length 50th (ft)	87	270	3	97	200	0	97	382	28	75	389	0
Queue Length 95th (ft)	#151	345	54	#221	262	40	#225	474	81	#176	482	37
Internal Link Dist (ft)		2634			2548			1708			2253	
Turn Bay Length (ft)	198		200	188		200	195		180	195		200
Base Capacity (vph)	269	952	497	234	958	477	265	1394	722	265	1376	651
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.82	0.30	0.87	0.64	0.23	0.82	0.82	0.31	0.72	0.84	0.17

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 36.8

Intersection LOS: D

Intersection Capacity Utilization 84.1%

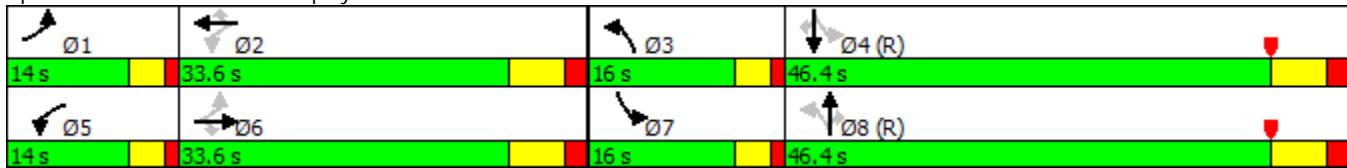
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

2030 Vol./RT Lane At All Approaches
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	2	1	1	2	1	1	2	1	1	2	1
Traffic Volume (vph)	127	509	128	221	988	78	219	848	125	110	990	145
Future Volume (vph)	127	509	128	221	988	78	219	848	125	110	990	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		200	195		180	195		200
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.140			0.290			0.119			0.141		
Satd. Flow (perm)	261	3539	1583	540	3539	1583	222	3539	1583	263	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139			125			129			130
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			1788			2333	
Travel Time (s)		61.7			59.7			40.6			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	553	139	240	1074	85	238	922	136	120	1076	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	138	553	139	240	1074	85	238	922	136	120	1076	158
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right									
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex											
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm									
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4

Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

2030 Vol./RT Lane At All Approaches
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0	15.0	8.0	15.0	15.0	8.0	15.0	15.0
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5	28.5	12.0	28.5	28.5	12.0	30.5	30.5
Total Split (s)	12.0	35.0	35.0	13.0	36.0	36.0	15.0	40.0	40.0	12.0	37.0	37.0
Total Split (%)	12.0%	35.0%	35.0%	13.0%	36.0%	36.0%	15.0%	40.0%	40.0%	12.0%	37.0%	37.0%
Maximum Green (s)	8.0	28.5	28.5	9.0	29.5	29.5	11.0	33.5	33.5	8.0	30.5	30.5
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5	0.0	0.0	-2.5	-2.5	0.0	-2.5	0.0
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0	6.5	4.0	4.0	4.0	4.0	4.0	6.5
Lead/Lag	Lead	Lag	Lag									
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0
Flash Dont Walk (s)		23.0	23.0		18.0	18.0		18.0	18.0		20.0	20.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0		0	0
Act Effct Green (s)	39.0	31.0	28.5	41.0	32.0	29.5	47.0	36.0	36.0	41.0	33.0	30.5
Actuated g/C Ratio	0.39	0.31	0.28	0.41	0.32	0.30	0.47	0.36	0.36	0.41	0.33	0.30
v/c Ratio	0.62	0.50	0.25	0.72	0.95	0.15	0.87	0.72	0.21	0.53	0.92	0.28
Control Delay	30.5	30.2	6.1	33.4	51.0	2.4	51.8	31.7	5.4	23.9	46.2	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	30.2	6.1	33.4	51.0	2.4	51.8	31.7	5.4	23.9	46.2	8.4
LOS	C	C	A	C	D	A	D	C	A	C	D	A
Approach Delay		26.2			45.0			32.6			39.8	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	52	151	0	96	349	0	94	264	3	41	344	13
Queue Length 95th (ft)	#101	203	44	#171	#485	15	#232	338	42	74	#474	59
Internal Link Dist (ft)		2634			2548			1708			2253	
Turn Bay Length (ft)	198		200	188		200	195		180	195		200
Base Capacity (vph)	222	1097	550	332	1132	555	274	1274	652	228	1167	573
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.50	0.25	0.72	0.95	0.15	0.87	0.72	0.21	0.53	0.92	0.28

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 37.1

Intersection LOS: D

Intersection Capacity Utilization 87.2%

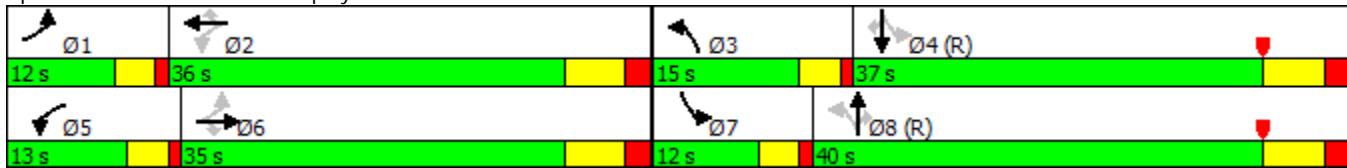
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2030 Vol./RT Lane At All Approaches

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	183	769	148	202	604	107	215	1138	223	189	1152	112
Future Volume (vph)	183	769	148	202	604	107	215	1138	223	189	1152	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		200	195		180	195		200
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.182			0.145			0.102			0.104		
Satd. Flow (perm)	339	3539	1583	270	3539	1583	190	3539	1583	194	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			144			116			157			114
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			1788			2333	
Travel Time (s)		61.7			59.7			40.6			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	199	836	161	220	657	116	234	1237	242	205	1252	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	199	836	161	220	657	116	234	1237	242	205	1252	122
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right									
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex											
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm									
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2030 Vol./RT Lane At All Approaches
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0	15.0	8.0	15.0	15.0	8.0	15.0	15.0
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5	28.5	12.0	28.5	28.5	12.0	30.5	30.5
Total Split (s)	14.0	34.0	34.0	14.0	34.0	34.0	18.0	44.0	44.0	18.0	44.0	44.0
Total Split (%)	12.7%	30.9%	30.9%	12.7%	30.9%	30.9%	16.4%	40.0%	40.0%	16.4%	40.0%	40.0%
Maximum Green (s)	10.0	27.5	27.5	10.0	27.5	27.5	14.0	37.5	37.5	14.0	37.5	37.5
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5	0.0	0.0	-2.5	-2.5	0.0	-2.5	0.0
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0	6.5	4.0	4.0	4.0	4.0	4.0	6.5
Lead/Lag	Lead	Lag	Lag									
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0
Flash Dont Walk (s)	23.0	23.0			18.0	18.0		18.0	18.0		20.0	20.0
Pedestrian Calls (#/hr)	0	0			0	0		0	0		0	0
Act Effct Green (s)	40.0	30.0	27.5	40.0	30.0	27.5	54.8	41.7	41.7	53.2	41.0	38.5
Actuated g/C Ratio	0.36	0.27	0.25	0.36	0.27	0.25	0.50	0.38	0.38	0.48	0.37	0.35
v/c Ratio	0.79	0.87	0.32	0.94	0.68	0.24	0.83	0.92	0.35	0.76	0.95	0.19
Control Delay	46.3	48.9	9.1	72.3	40.0	7.4	49.1	45.3	10.6	41.0	49.9	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	48.9	9.1	72.3	40.0	7.4	49.1	45.3	10.6	41.0	49.9	6.4
LOS	D	D	A	E	D	A	D	D	B	D	D	A
Approach Delay		43.1			43.3				41.0			45.3
Approach LOS		D			D			D				D
Queue Length 50th (ft)	94	296	9	105	218	0	107	442	40	85	453	4
Queue Length 95th (ft)	#183	#398	62	#251	283	44	#232	#595	101	#179	#607	44
Internal Link Dist (ft)		2634			2548			1708			2253	
Turn Bay Length (ft)	198		200	188		200	195		180	195		200
Base Capacity (vph)	253	965	503	234	965	482	297	1342	697	297	1317	627
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.87	0.32	0.94	0.68	0.24	0.79	0.92	0.35	0.69	0.95	0.19

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 43.1

Intersection LOS: D

Intersection Capacity Utilization 89.5%

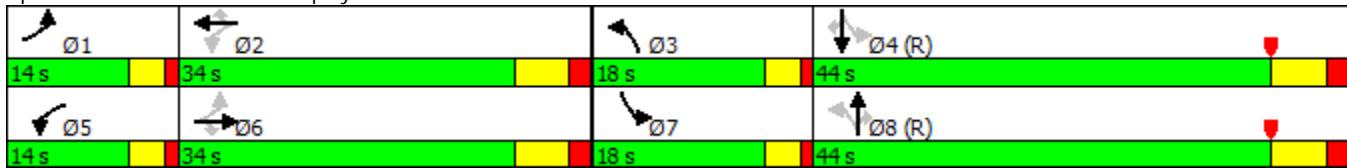
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

2040 Vol./RT Lane At All Approaches

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	548	138	238	1065	84	236	914	135	118	1067	157
Future Volume (vph)	136	548	138	238	1065	84	236	914	135	118	1067	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		200	195		180	195		200
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Fr _t			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.140			0.251			0.123			0.123		
Satd. Flow (perm)	261	3539	1583	468	3539	1583	229	3539	1583	229	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			125			128			134
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			1788			2333	
Travel Time (s)		61.7			59.7			40.6			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	596	150	259	1158	91	257	993	147	128	1160	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	148	596	150	259	1158	91	257	993	147	128	1160	171
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right									
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex											
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm									
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4

Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

2040 Vol./RT Lane At All Approaches

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0	15.0	8.0	15.0	15.0	8.0	15.0	15.0
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5	28.5	12.0	28.5	28.5	12.0	30.5	30.5
Total Split (s)	12.0	35.0	35.0	14.0	37.0	37.0	12.0	39.0	39.0	12.0	39.0	39.0
Total Split (%)	12.0%	35.0%	35.0%	14.0%	37.0%	37.0%	12.0%	39.0%	39.0%	12.0%	39.0%	39.0%
Maximum Green (s)	8.0	28.5	28.5	10.0	30.5	30.5	8.0	32.5	32.5	8.0	32.5	32.5
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5	0.0	0.0	-2.5	-2.5	0.0	-2.5	0.0
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0	6.5	4.0	4.0	4.0	4.0	4.0	6.5
Lead/Lag	Lead	Lag	Lag									
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0
Flash Dont Walk (s)		23.0	23.0		18.0	18.0		18.0	18.0		20.0	20.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	39.0	31.0	28.5	43.0	33.0	30.5	43.0	35.0	35.0	43.0	35.0	32.5
Actuated g/C Ratio	0.39	0.31	0.28	0.43	0.33	0.30	0.43	0.35	0.35	0.43	0.35	0.32
v/c Ratio	0.67	0.54	0.27	0.78	0.99	0.16	1.16	0.80	0.23	0.58	0.94	0.28
Control Delay	33.4	30.9	6.0	37.1	58.8	2.7	134.9	35.3	6.6	26.9	46.5	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	30.9	6.0	37.1	58.8	2.7	134.9	35.3	6.6	26.9	46.5	8.4
LOS	C	C	A	D	E	A	F	D	A	C	D	A
Approach Delay		27.1			51.7				50.6			40.3
Approach LOS		C			D				D			D
Queue Length 50th (ft)	55	165	0	103	383	0	~140	297	8	45	372	16
Queue Length 95th (ft)	#116	220	45	#174	#534	19	#300	378	49	83	#510	64
Internal Link Dist (ft)		2634			2548			1708			2253	
Turn Bay Length (ft)	198		200	188		200	195		180	195		200
Base Capacity (vph)	222	1097	558	331	1167	569	221	1238	637	221	1238	604
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.54	0.27	0.78	0.99	0.16	1.16	0.80	0.23	0.58	0.94	0.28

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.16

Intersection Signal Delay: 44.1

Intersection LOS: D

Intersection Capacity Utilization 92.9%

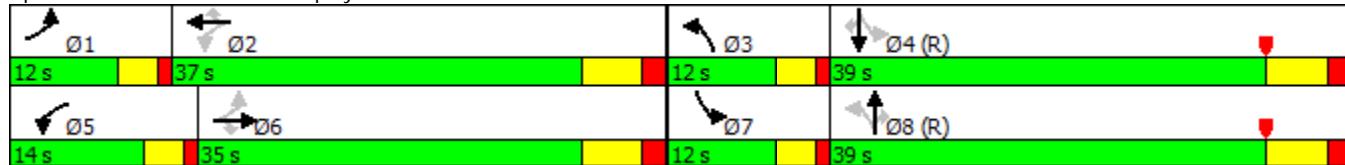
ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

- Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2040 Vol./RT Lane At All Approaches

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	197	829	159	218	651	115	232	1226	240	203	1242	121
Future Volume (vph)	197	829	159	218	651	115	232	1226	240	203	1242	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		200	195		180	195		200
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.148			0.159			0.089			0.093		
Satd. Flow (perm)	276	3539	1583	296	3539	1583	166	3539	1583	173	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			143			125			175			114
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			1788			2333	
Travel Time (s)		61.7			59.7			40.6			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	214	901	173	237	708	125	252	1333	261	221	1350	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	214	901	173	237	708	125	252	1333	261	221	1350	132
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right									
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex											
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm									
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2	8		8	4		4

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2040 Vol./RT Lane At All Approaches

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0	15.0	8.0	15.0	15.0	8.0	15.0	15.0
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5	28.5	12.0	28.5	28.5	12.0	30.5	30.5
Total Split (s)	15.0	33.6	33.6	13.0	31.6	31.6	14.0	51.4	51.4	12.0	49.4	49.4
Total Split (%)	13.6%	30.5%	30.5%	11.8%	28.7%	28.7%	12.7%	46.7%	46.7%	10.9%	44.9%	44.9%
Maximum Green (s)	11.0	27.1	27.1	9.0	25.1	25.1	10.0	44.9	44.9	8.0	42.9	42.9
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5	0.0	0.0	-2.5	-2.5	0.0	-2.5	0.0
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0	6.5	4.0	4.0	4.0	4.0	4.0	6.5
Lead/Lag	Lead	Lag	Lag									
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0
Flash Dont Walk (s)		23.0	23.0		18.0	18.0		18.0	18.0		20.0	20.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0		0	0
Act Effct Green (s)	40.6	29.6	27.1	36.6	27.6	25.1	57.4	47.4	47.4	53.4	45.4	42.9
Actuated g/C Ratio	0.37	0.27	0.25	0.33	0.25	0.23	0.52	0.43	0.43	0.49	0.41	0.39
v/c Ratio	0.85	0.95	0.35	1.08	0.80	0.27	1.09	0.87	0.33	1.10	0.92	0.19
Control Delay	55.2	58.8	10.7	112.9	46.4	7.9	111.2	36.4	8.2	120.7	42.6	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.2	58.8	10.7	112.9	46.4	7.9	111.2	36.4	8.2	120.7	42.6	6.3
LOS	E	E	B	F	D	A	F	D	A	F	D	A
Approach Delay		51.7			56.7				42.6			49.9
Approach LOS		D			E				D			D
Queue Length 50th (ft)	104	328	16	-131	247	0	-146	442	36	-124	467	8
Queue Length 95th (ft)	#227	#456	73	#292	318	47	#309	544	92	#280	#616	46
Internal Link Dist (ft)		2634			2548			1708			2253	
Turn Bay Length (ft)	198		200	188		200	195		180	195		200
Base Capacity (vph)	251	952	497	219	887	457	232	1524	781	200	1460	686
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.95	0.35	1.08	0.80	0.27	1.09	0.87	0.33	1.10	0.92	0.19

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.10

Intersection Signal Delay: 49.3

Intersection LOS: D

Intersection Capacity Utilization 95.5%

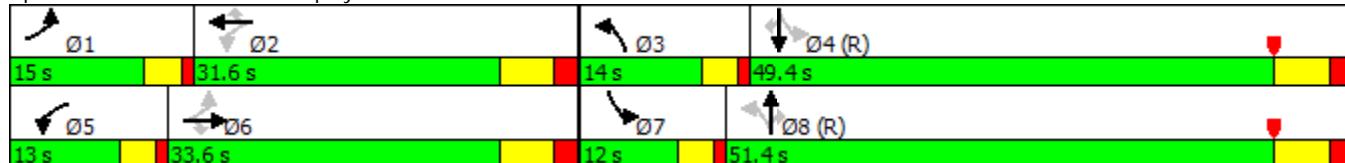
ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

- Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

2020 Vol./Dual LT Turn Lanes All Approaches, EBRT
AM Peak Hour

	→	→	→	←	←	↑	↑	↑	↓	↓	←	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑
Traffic Volume (vph)	117	472	118	205	917	72	203	787	116	102	919	135
Future Volume (vph)	117	472	118	205	917	72	203	787	116	102	919	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	2		1	2		0	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	0.95	0.97	0.95	1.00	0.97	0.95	0.95
Fr _t			0.850		0.989				0.850		0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3500	0	3433	3539	1583	3433	3472	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	3433	3500	0	3433	3539	1583	3433	3472	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			141		7				141			15
Link Speed (mph)		30			30			30				30
Link Distance (ft)		2714			2628			1788				2333
Travel Time (s)		61.7			59.7			40.6				53.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	127	513	128	223	997	78	221	855	126	111	999	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	127	513	128	223	1075	0	221	855	126	111	1146	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		24			24			24				24
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane		Yes			Yes			Yes				Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6					8				



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		4.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		8.0	28.5	28.5	12.0	30.5	
Total Split (s)	12.0	40.0	40.0	17.0	45.0		17.0	46.0	46.0	17.0	46.0	
Total Split (%)	10.0%	33.3%	33.3%	14.2%	37.5%		14.2%	38.3%	38.3%	14.2%	38.3%	
Maximum Green (s)	8.0	33.5	33.5	13.0	38.5		13.0	39.5	39.5	13.0	39.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.5	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		0.5	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Min	C-Min	None	C-Min	
Walk Time (s)		4.0	4.0		4.0			4.0	4.0		4.0	
Flash Dont Walk (s)	23.0	23.0			18.0			18.0	18.0		20.0	
Pedestrian Calls (#/hr)	0	0			0			0	0		0	
Act Effct Green (s)	8.0	37.0	34.5	12.0	41.0		12.0	45.5	45.5	9.5	43.0	
Actuated g/C Ratio	0.07	0.31	0.29	0.10	0.34		0.10	0.38	0.38	0.08	0.36	
v/c Ratio	0.56	0.47	0.23	0.65	0.90		0.65	0.64	0.18	0.41	0.91	
Control Delay	64.1	35.6	5.3	61.2	48.2		61.1	33.4	3.8	56.9	48.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	64.1	35.6	5.3	61.2	48.2		61.1	33.4	3.8	56.9	48.6	
LOS	E	D	A	E	D		E	C	A	E	D	
Approach Delay		35.2			50.4			35.4			49.3	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	50	171	0	86	411		85	281	0	43	444	
Queue Length 95th (ft)	82	225	39	128	#535		127	363	32	71	#585	
Internal Link Dist (ft)		2634			2548			1708			2253	
Turn Bay Length (ft)	198		200	188			195		180	195		
Base Capacity (vph)	228	1090	555	371	1200		371	1342	687	371	1254	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.56	0.47	0.23	0.60	0.90		0.60	0.64	0.18	0.30	0.91	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:SBT and 8:NBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 43.5

Intersection LOS: D

Intersection Capacity Utilization 83.1%

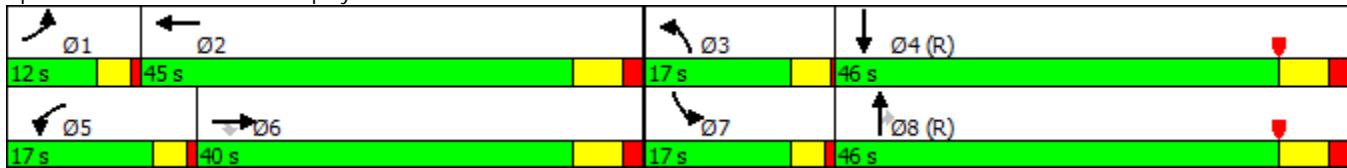
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2020 Vol./Dual LT Turn Lanes All Approaches, EBRT

PM Peak Hour

	↑	→	↓	↗	↖	↙	↖	↑	↗	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑
Traffic Volume (vph)	170	714	137	188	561	99	200	1056	207	175	1069	104
Future Volume (vph)	170	714	137	188	561	99	200	1056	207	175	1069	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	2		1	2		0	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	0.95	0.97	0.95	1.00	0.97	0.95	0.95
Fr _t			0.850		0.977				0.850		0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3458	0	3433	3539	1583	3433	3493	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	3433	3458	0	3433	3539	1583	3433	3493	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			128		16				151		10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			1788			2333	
Travel Time (s)		61.7			59.7			40.6			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	776	149	204	610	108	217	1148	225	190	1162	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	185	776	149	204	718	0	217	1148	225	190	1275	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6						8			

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2020 Vol./Dual LT Turn Lanes All Approaches, EBRT

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		12.0	28.5	28.5	12.0	30.5	
Total Split (s)	17.0	34.0	34.0	17.0	34.0		18.0	51.0	51.0	18.0	51.0	
Total Split (%)	14.2%	28.3%	28.3%	14.2%	28.3%		15.0%	42.5%	42.5%	15.0%	42.5%	
Maximum Green (s)	13.0	27.5	27.5	13.0	27.5		14.0	44.5	44.5	14.0	44.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Max	C-Max	None	C-Max	
Walk Time (s)		4.0	4.0		4.0			4.0	4.0		4.0	
Flash Dont Walk (s)		23.0	23.0		18.0			18.0	18.0		20.0	
Pedestrian Calls (#/hr)	0	0		0				0	0		0	
Act Effct Green (s)	11.3	31.3	28.8	11.7	31.7		12.3	49.3	49.3	11.7	48.7	
Actuated g/C Ratio	0.09	0.26	0.24	0.10	0.26		0.10	0.41	0.41	0.10	0.41	
v/c Ratio	0.57	0.84	0.31	0.61	0.78		0.62	0.79	0.30	0.57	0.90	
Control Delay	58.9	51.8	11.0	60.0	47.1		59.2	36.0	9.6	58.3	42.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	58.9	51.8	11.0	60.0	47.1		59.2	36.0	9.6	58.3	42.9	
LOS	E	D	B	E	D		E	D	A	E	D	
Approach Delay		47.5			49.9			35.5			44.9	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	71	303	13	78	267		84	403	35	73	480	
Queue Length 95th (ft)	108	#408	68	119	345		124	507	93	110	#634	
Internal Link Dist (ft)		2634			2548			1708			2253	
Turn Bay Length (ft)	198		200	188			195		180	195		
Base Capacity (vph)	371	923	477	371	924		400	1454	739	400	1423	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.50	0.84	0.31	0.55	0.78		0.54	0.79	0.30	0.47	0.90	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:SBT and 8:NBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 43.4

Intersection LOS: D

Intersection Capacity Utilization 79.3%

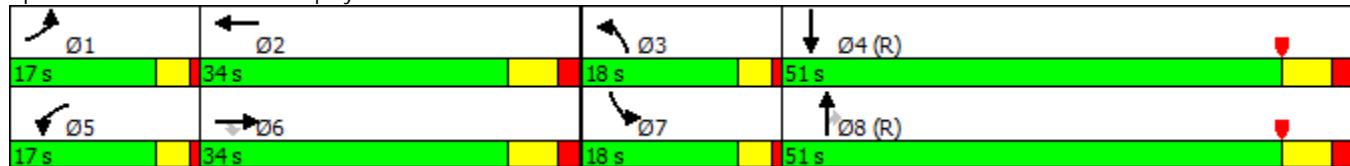
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

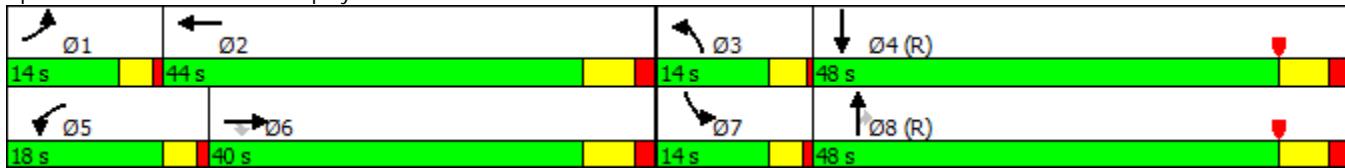
2030 Vol./Dual LT Turn Lanes All Approaches, EBRT
AM Peak Hour

	→	→	→	←	←	↑	↑	↑	↓	↓	←	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑
Traffic Volume (vph)	127	509	128	221	988	78	219	848	125	110	990	145
Future Volume (vph)	127	509	128	221	988	78	219	848	125	110	990	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	2		1	2		0	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	0.95	0.97	0.95	1.00	0.97	0.95	0.95
Fr _t			0.850		0.989				0.850		0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3500	0	3433	3539	1583	3433	3472	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	3433	3500	0	3433	3539	1583	3433	3472	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139		7				109			15
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			1788			2333	
Travel Time (s)		61.7			59.7			40.6			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	553	139	240	1074	85	238	922	136	120	1076	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	138	553	139	240	1159	0	238	922	136	120	1234	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6					8				

	↗	→	↘	↖	←	↙	↑	↗	↘	↓	↖							
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Detector Phase	1	6	6	5	2		3	8	8	7	4							
Switch Phase																		
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		4.0	15.0	15.0	8.0	15.0							
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		8.0	28.5	28.5	12.0	30.5							
Total Split (s)	14.0	40.0	40.0	18.0	44.0		14.0	48.0	48.0	14.0	48.0							
Total Split (%)	11.7%	33.3%	33.3%	15.0%	36.7%		11.7%	40.0%	40.0%	11.7%	40.0%							
Maximum Green (s)	10.0	33.5	33.5	14.0	37.5		10.0	41.5	41.5	10.0	41.5							
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.5	4.5	4.5	3.0	4.5							
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		0.5	2.0	2.0	1.0	2.0							
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5							
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0	4.0	4.0	4.0							
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?						Yes												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0							
Recall Mode	None	Max	Max	None	Max		None	C-Min	C-Min	None	C-Min							
Walk Time (s)		4.0	4.0		4.0			4.0	4.0		4.0							
Flash Dont Walk (s)	23.0	23.0			18.0			18.0	18.0		20.0							
Pedestrian Calls (#/hr)	0	0			0			0	0		0							
Act Effct Green (s)	9.4	37.3	34.8	12.7	40.6		10.0	44.8	44.8	9.2	44.0							
Actuated g/C Ratio	0.08	0.31	0.29	0.11	0.34		0.08	0.37	0.37	0.08	0.37							
v/c Ratio	0.51	0.50	0.25	0.66	0.98		0.83	0.70	0.21	0.46	0.96							
Control Delay	60.1	36.0	6.6	60.5	60.2		78.2	35.5	8.1	58.7	54.7							
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0							
Total Delay	60.1	36.0	6.6	60.5	60.2		78.2	35.5	8.1	58.7	54.7							
LOS	E	D	A	E	E		E	D	A	E	D							
Approach Delay		35.1			60.3			40.4			55.1							
Approach LOS		D			E			D			E							
Queue Length 50th (ft)	53	185	0	92	465		95	316	13	46	483							
Queue Length 95th (ft)	87	244	48	136	#622		#162	395	56	77	#637							
Internal Link Dist (ft)		2634			2548			1708			2253							
Turn Bay Length (ft)	198		200	188			195		180	195								
Base Capacity (vph)	286	1099	557	400	1188		286	1321	659	286	1282							
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0							
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0							
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0							
Reduced v/c Ratio	0.48	0.50	0.25	0.60	0.98		0.83	0.70	0.21	0.42	0.96							
Intersection Summary																		
Area Type:	Other																	
Cycle Length: 120																		
Actuated Cycle Length: 120																		
Offset: 0 (0%), Referenced to phase 4:SBT and 8:NBT, Start of Yellow																		
Natural Cycle: 100																		
Control Type: Actuated-Coordinated																		
Maximum v/c Ratio: 0.98																		
Intersection Signal Delay: 49.3	Intersection LOS: D																	
Intersection Capacity Utilization 88.0%	ICU Level of Service E																	
Analysis Period (min) 15																		
# 95th percentile volume exceeds capacity, queue may be longer.																		

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2030 Vol./Dual LT Turn Lanes All Approaches, EBRT

PM Peak Hour

	↑	→	↓	↗	↖	↙	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑	↑↑	↑↑	↑↑
Traffic Volume (vph)	183	769	148	202	604	107	215	1138	223	189	1152	112
Future Volume (vph)	183	769	148	202	604	107	215	1138	223	189	1152	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	2		1	2		0	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	0.95	0.97	0.95	1.00	0.97	0.95	0.95
Fr _t			0.850		0.977				0.850		0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3458	0	3433	3539	1583	3433	3493	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	3433	3458	0	3433	3539	1583	3433	3493	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131		16				157		10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			1788			2333	
Travel Time (s)		61.7			59.7			40.6			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	199	836	161	220	657	116	234	1237	242	205	1252	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	199	836	161	220	773	0	234	1237	242	205	1374	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6					8				

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2030 Vol./Dual LT Turn Lanes All Approaches, EBRT

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		12.0	28.5	28.5	12.0	30.5	
Total Split (s)	14.0	36.0	36.0	14.0	36.0		16.0	54.0	54.0	16.0	54.0	
Total Split (%)	11.7%	30.0%	30.0%	11.7%	30.0%		13.3%	45.0%	45.0%	13.3%	45.0%	
Maximum Green (s)	10.0	29.5	29.5	10.0	29.5		12.0	47.5	47.5	12.0	47.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Max	C-Max	None	C-Max	
Walk Time (s)		4.0	4.0		4.0			4.0	4.0		4.0	
Flash Dont Walk (s)		23.0	23.0		18.0			18.0	18.0		20.0	
Pedestrian Calls (#/hr)	0	0		0				0	0		0	
Act Effct Green (s)	9.8	32.1	29.6	9.9	32.2		11.5	50.8	50.8	11.2	50.5	
Actuated g/C Ratio	0.08	0.27	0.25	0.08	0.27		0.10	0.42	0.42	0.09	0.42	
v/c Ratio	0.71	0.88	0.33	0.77	0.82		0.71	0.83	0.32	0.64	0.93	
Control Delay	68.2	54.5	11.5	72.6	48.9		65.0	36.7	9.5	62.0	45.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	68.2	54.5	11.5	72.6	48.9		65.0	36.7	9.5	62.0	45.5	
LOS	E	D	B	E	D		E	D	A	E	D	
Approach Delay		51.0			54.2			36.7			47.6	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	78	328	18	87	292		91	445	40	79	525	
Queue Length 95th (ft)	#124	#436	75	#146	370		135	541	98	120	#682	
Internal Link Dist (ft)		2634			2548			1708			2253	
Turn Bay Length (ft)	198		200	188			195		180	195		
Base Capacity (vph)	286	945	488	286	939		343	1498	760	343	1474	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.70	0.88	0.33	0.77	0.82		0.68	0.83	0.32	0.60	0.93	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:SBT and 8:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 46.1

Intersection LOS: D

Intersection Capacity Utilization 83.3%

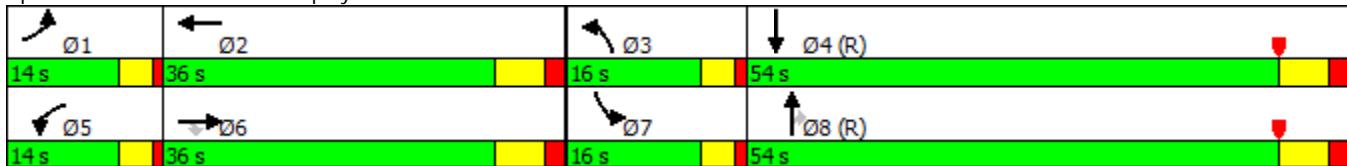
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

2040 Vol./Dual LT Turn Lanes All Approaches, EBRT

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	548	138	238	1065	84	236	914	135	118	1067	157
Future Volume (vph)	136	548	138	238	1065	84	236	914	135	118	1067	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	2		1	2		0	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	0.95	0.97	0.95	1.00	0.97	0.95	0.95
Fr _t			0.850		0.989				0.850		0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3500	0	3433	3539	1583	3433	3472	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	3433	3500	0	3433	3539	1583	3433	3472	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150		7				141		16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			1788			2333	
Travel Time (s)		61.7			59.7			40.6			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	596	150	259	1158	91	257	993	147	128	1160	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	148	596	150	259	1249	0	257	993	147	128	1331	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6						8			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		4.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		8.0	28.5	28.5	12.0	30.5	
Total Split (s)	12.0	38.4	38.4	19.0	45.4		13.0	50.6	50.6	12.0	49.6	
Total Split (%)	10.0%	32.0%	32.0%	15.8%	37.8%		10.8%	42.2%	42.2%	10.0%	41.3%	
Maximum Green (s)	8.0	31.9	31.9	15.0	38.9		9.0	44.1	44.1	8.0	43.1	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.5	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		0.5	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?						Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Min	C-Min	None	C-Min	
Walk Time (s)		4.0	4.0		4.0			4.0	4.0		4.0	
Flash Dont Walk (s)		23.0	23.0		18.0			18.0	18.0		20.0	
Pedestrian Calls (#/hr)		0	0		0			0	0		0	
Act Effct Green (s)	8.0	35.9	33.4	13.5	41.4		9.0	46.6	46.6	8.0	45.6	
Actuated g/C Ratio	0.07	0.30	0.28	0.11	0.34		0.08	0.39	0.39	0.07	0.38	
v/c Ratio	0.65	0.56	0.27	0.67	1.03		1.00	0.72	0.21	0.56	1.00	
Control Delay	68.5	38.2	6.7	60.0	72.7		111.8	34.9	5.1	64.3	62.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	68.5	38.2	6.7	60.0	72.7		111.8	34.9	5.1	64.3	62.0	
LOS	E	D	A	E	E		F	C	A	E	E	
Approach Delay		37.9			70.5			45.9			62.2	
Approach LOS		D			E			D			E	
Queue Length 50th (ft)	58	206	0	100	-544		104	340	3	50	~534	
Queue Length 95th (ft)	#95	269	51	144	#682		#192	419	44	83	#701	
Internal Link Dist (ft)		2634			2548			1708			2253	
Turn Bay Length (ft)	198		200	188			195		180	195		
Base Capacity (vph)	228	1059	548	429	1212		257	1374	700	228	1329	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.65	0.56	0.27	0.60	1.03		1.00	0.72	0.21	0.56	1.00	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:SBT and 8:NBT, Start of Yellow

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.03

Intersection Signal Delay: 56.1

Intersection LOS: E

Intersection Capacity Utilization 93.3%

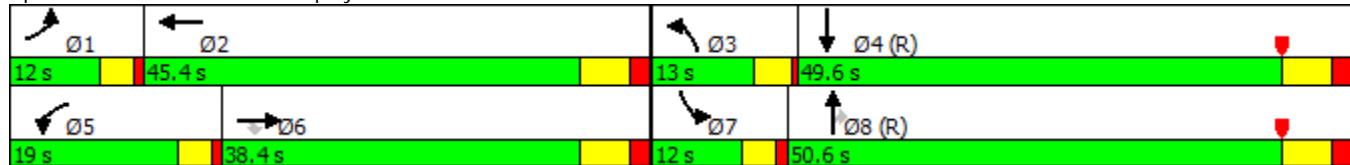
ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

- Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2040 Vol./Dual LT Turn Lanes All Approaches, EBRT

PM Peak Hour

	↑	→	↓	↗	↖	↙	↖	↑	↗	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑	↑↑	↑↑	↑↑
Traffic Volume (vph)	197	829	159	218	651	115	232	1226	240	203	1242	121
Future Volume (vph)	197	829	159	218	651	115	232	1226	240	203	1242	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	2		1	2		0	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	0.95	0.97	0.95	1.00	0.97	0.95	0.95
Fr _t			0.850		0.977				0.850		0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3458	0	3433	3539	1583	3433	3493	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	3433	3458	0	3433	3539	1583	3433	3493	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			17			166			11
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			1788			2333	
Travel Time (s)		61.7			59.7			40.6			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	214	901	173	237	708	125	252	1333	261	221	1350	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	214	901	173	237	833	0	252	1333	261	221	1482	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6						8			

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2040 Vol./Dual LT Turn Lanes All Approaches, EBRT

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0	15.0	8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		12.0	28.5	28.5	12.0	30.5	
Total Split (s)	12.0	36.0	36.0	13.0	37.0		13.0	58.0	58.0	13.0	58.0	
Total Split (%)	10.0%	30.0%	30.0%	10.8%	30.8%		10.8%	48.3%	48.3%	10.8%	48.3%	
Maximum Green (s)	8.0	29.5	29.5	9.0	30.5		9.0	51.5	51.5	9.0	51.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Max	C-Max	None	C-Max	
Walk Time (s)		4.0	4.0		4.0			4.0	4.0		4.0	
Flash Dont Walk (s)		23.0	23.0		18.0			18.0	18.0		20.0	
Pedestrian Calls (#/hr)	0	0		0				0	0		0	
Act Effct Green (s)	8.0	32.0	29.5	9.0	33.0		9.0	54.0	54.0	9.0	54.0	
Actuated g/C Ratio	0.07	0.27	0.25	0.08	0.28		0.08	0.45	0.45	0.08	0.45	
v/c Ratio	0.94	0.96	0.36	0.92	0.87		0.98	0.84	0.33	0.86	0.94	
Control Delay	101.6	63.9	13.0	94.6	51.2		107.0	35.0	8.8	84.5	43.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	101.6	63.9	13.0	94.6	51.2		107.0	35.0	8.8	84.5	43.9	
LOS	F	E	B	F	D		F	D	A	F	D	
Approach Delay		63.4			60.8			41.1			49.2	
Approach LOS		E			E			D			D	
Queue Length 50th (ft)	86	362	25	95	317		102	468	42	88	560	
Queue Length 95th (ft)	#163	#493	86	#173	#421		#188	568	99	#158	#725	
Internal Link Dist (ft)		2634			2548			1708			2253	
Turn Bay Length (ft)	198		200	188			195		180	195		
Base Capacity (vph)	228	943	487	257	963		257	1592	803	257	1577	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.94	0.96	0.36	0.92	0.87		0.98	0.84	0.33	0.86	0.94	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:SBT and 8:NBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 51.9

Intersection LOS: D

Intersection Capacity Utilization 87.8%

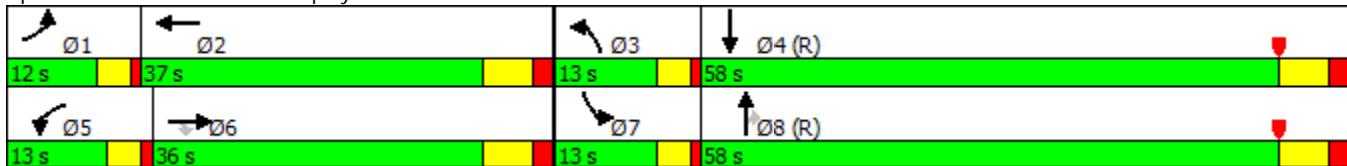
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7550: Stapley Dr & Southern Ave



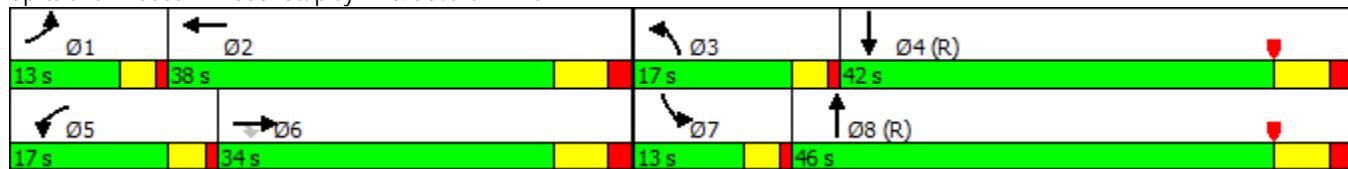
Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

2030 Vol./Full Build Out
AM Peak Hour

	↑	→	↓	↗	↖	↙	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑↑	↑	↑↑	↑↑↑	↑↑	↑↑	↑↑↑	↑↑	↑↑	↑↑↑	↑↑
Traffic Volume (vph)	117	472	118	205	917	72	203	787	116	102	919	135
Future Volume (vph)	117	472	118	205	917	72	203	787	116	102	919	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	2		1	2		0	2		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Fr _t			0.850		0.989			0.981			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	5029	0	3433	4989	0	3433	4989	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	5029	0	3433	4989	0	3433	4989	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			128			12			29			27
Link Speed (mph)			30			30			30			30
Link Distance (ft)			2714			2628			1788			2333
Travel Time (s)			61.7			59.7			40.6			53.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	127	513	128	223	997	78	221	855	126	111	999	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	127	513	128	223	1075	0	221	981	0	111	1146	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane			Yes			Yes			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)			94			94			94			94
Detector 2 Size(ft)			6			6			6			6
Detector 2 Type			Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)			0.0			0.0			0.0			0.0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6									

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0		8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		12.0	28.5		12.0	30.5	
Total Split (s)	13.0	34.0	34.0	17.0	38.0		17.0	46.0		13.0	42.0	
Total Split (%)	11.8%	30.9%	30.9%	15.5%	34.5%		15.5%	41.8%		11.8%	38.2%	
Maximum Green (s)	9.0	27.5	27.5	13.0	31.5		13.0	39.5		9.0	35.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5		3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5		0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Min		None	C-Min	
Walk Time (s)		4.0	4.0		4.0			4.0			4.0	
Flash Dont Walk (s)	23.0	23.0			18.0			18.0			20.0	
Pedestrian Calls (#/hr)	0	0		0				0			0	
Act Effct Green (s)	8.8	34.2	31.7	11.7	37.1		11.6	39.6		8.6	36.5	
Actuated g/C Ratio	0.08	0.31	0.29	0.11	0.34		0.11	0.36		0.08	0.33	
v/c Ratio	0.47	0.32	0.23	0.61	0.63		0.61	0.54		0.42	0.68	
Control Delay	54.2	30.7	6.9	54.4	32.9		54.4	28.1		53.2	33.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	54.2	30.7	6.9	54.4	32.9		54.4	28.1		53.2	33.2	
LOS	D	C	A	D	C		D	C		D	C	
Approach Delay		30.6			36.6			32.9			35.0	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	44	104	0	78	236		77	190		39	245	
Queue Length 95th (ft)	76	141	47	118	291		117	228		68	294	
Internal Link Dist (ft)		2634			2548			1708			2253	
Turn Bay Length (ft)	198		200	188			195			195		
Base Capacity (vph)	283	1579	547	405	1703		405	1922		280	1741	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.45	0.32	0.23	0.55	0.63		0.55	0.51		0.40	0.66	
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 0 (0%), Referenced to phase 4:SBT and 8:NBT, Start of Yellow												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.68												
Intersection Signal Delay: 34.2	Intersection LOS: C											
Intersection Capacity Utilization 66.8%	ICU Level of Service C											
Analysis Period (min) 15												

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2020 Vol./Full Build Out
PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑↑	↑	↑↑	↑↑↑	↑↑	↑↑	↑↑↑	↑↑	↑↑	↑↑↑	↑↑
Traffic Volume (vph)	170	714	137	188	561	99	200	1056	207	175	1069	104
Future Volume (vph)	170	714	137	188	561	99	200	1056	207	175	1069	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	2		1	2		0	2		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Fr _t			0.850		0.977			0.975			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	4968	0	3433	4958	0	3433	5019	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	4968	0	3433	4958	0	3433	5019	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			149			29			41			16
Link Speed (mph)			30			30			30			30
Link Distance (ft)			2714			2628			1788			2333
Travel Time (s)			61.7			59.7			40.6			53.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	776	149	204	610	108	217	1148	225	190	1162	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	185	776	149	204	718	0	217	1373	0	190	1275	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane			Yes			Yes			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)			94			94			94			94
Detector 2 Size(ft)			6			6			6			6
Detector 2 Type			Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)			0.0			0.0			0.0			0.0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6									

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2020 Vol./Full Build Out
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0		8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		12.0	28.5		12.0	30.5	
Total Split (s)	15.0	36.0	36.0	16.0	37.0		17.0	53.0		15.0	51.0	
Total Split (%)	12.5%	30.0%	30.0%	13.3%	30.8%		14.2%	44.2%		12.5%	42.5%	
Maximum Green (s)	11.0	29.5	29.5	12.0	30.5		13.0	46.5		11.0	44.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5		3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5		0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Max		None	C-Max	
Walk Time (s)		4.0	4.0		4.0			4.0			4.0	
Flash Dont Walk (s)	23.0	23.0		18.0			18.0			20.0		
Pedestrian Calls (#/hr)	0	0		0			0			0		
Act Effct Green (s)	10.4	32.8	30.3	11.2	33.6		11.9	49.6		10.4	48.1	
Actuated g/C Ratio	0.09	0.27	0.25	0.09	0.28		0.10	0.41		0.09	0.40	
v/c Ratio	0.62	0.56	0.29	0.64	0.51		0.64	0.66		0.64	0.63	
Control Delay	62.6	39.4	7.3	61.8	36.3		60.7	29.5		63.0	30.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	62.6	39.4	7.3	61.8	36.3		60.7	29.5		63.0	30.4	
LOS	E	D	A	E	D		E	C		E	C	
Approach Delay		39.0			42.0			33.8			34.6	
Approach LOS		D			D			C			C	
Queue Length 50th (ft)	72	190	0	79	165		84	303		74	287	
Queue Length 95th (ft)	111	235	52	120	207		125	357		113	339	
Internal Link Dist (ft)		2634			2548			1708			2253	
Turn Bay Length (ft)	198		200	188			195			195		
Base Capacity (vph)	314	1390	511	343	1412		371	2071		314	2020	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.59	0.56	0.29	0.59	0.51		0.58	0.66		0.61	0.63	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:SBT and 8:NBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 36.6

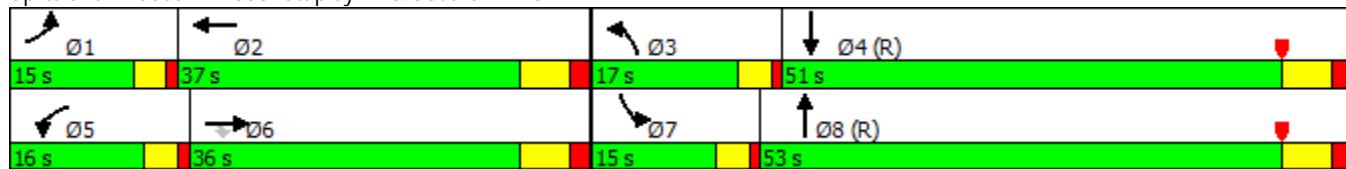
Intersection LOS: D

Intersection Capacity Utilization 65.5%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

2030 Vol./Full Build Out
AM Peak Hour

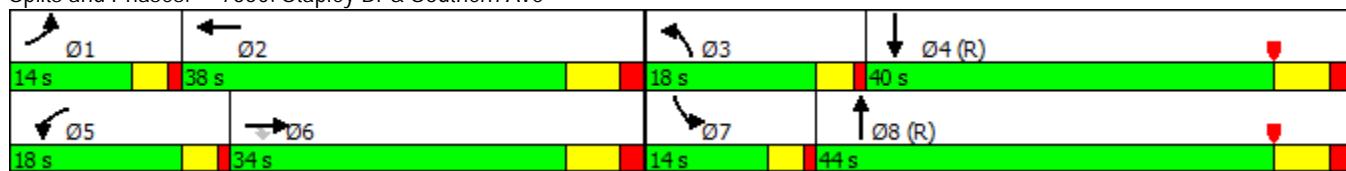
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑↑	↑	↑↑	↑↑↑	↑↑	↑↑	↑↑↑	↑↑	↑↑	↑↑↑	↑↑
Traffic Volume (vph)	127	509	128	221	988	78	219	848	125	110	990	145
Future Volume (vph)	127	509	128	221	988	78	219	848	125	110	990	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	2		1	2		0	2		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Fr _t			0.850		0.989			0.981			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	5029	0	3433	4989	0	3433	4989	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	5029	0	3433	4989	0	3433	4989	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139			12			28			26
Link Speed (mph)			30			30			30			30
Link Distance (ft)			2714			2628			1788			2333
Travel Time (s)			61.7			59.7			40.6			53.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	553	139	240	1074	85	238	922	136	120	1076	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	138	553	139	240	1159	0	238	1058	0	120	1234	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane			Yes			Yes			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)			94			94			94			94
Detector 2 Size(ft)			6			6			6			6
Detector 2 Type			Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)			0.0			0.0			0.0			0.0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6									

Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

2030 Vol./Full Build Out
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0		8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		12.0	28.5		12.0	30.5	
Total Split (s)	14.0	34.0	34.0	18.0	38.0		18.0	44.0		14.0	40.0	
Total Split (%)	12.7%	30.9%	30.9%	16.4%	34.5%		16.4%	40.0%		12.7%	36.4%	
Maximum Green (s)	10.0	27.5	27.5	14.0	31.5		14.0	37.5		10.0	33.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5		3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5		0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Min		None	C-Min	
Walk Time (s)		4.0	4.0		4.0			4.0			4.0	
Flash Dont Walk (s)		23.0	23.0		18.0			18.0			20.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	9.3	32.7	30.2	12.4	35.8		12.3	39.8		9.1	36.6	
Actuated g/C Ratio	0.08	0.30	0.27	0.11	0.33		0.11	0.36		0.08	0.33	
v/c Ratio	0.48	0.37	0.26	0.62	0.70		0.62	0.58		0.42	0.74	
Control Delay	53.6	31.9	6.8	53.8	35.3		53.7	29.0		52.6	35.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	53.6	31.9	6.8	53.8	35.3		53.7	29.0		52.6	35.0	
LOS	D	C	A	D	D		D	C		D	C	
Approach Delay		31.3			38.5			33.5			36.5	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	48	115	0	84	264		83	209		42	272	
Queue Length 95th (ft)	80	152	48	124	319		123	258		71	332	
Internal Link Dist (ft)		2634			2548			1708			2253	
Turn Bay Length (ft)	198		200	188			195			195		
Base Capacity (vph)	312	1513	536	436	1644		436	1853		312	1681	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.44	0.37	0.26	0.55	0.70		0.55	0.57		0.38	0.73	
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 0 (0%), Referenced to phase 4:SBT and 8:NBT, Start of Yellow												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.74												
Intersection Signal Delay: 35.4	Intersection LOS: D											
Intersection Capacity Utilization 69.9%	ICU Level of Service C											
Analysis Period (min) 15												

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2030 Vol./Full Build Out
PM Peak Hour

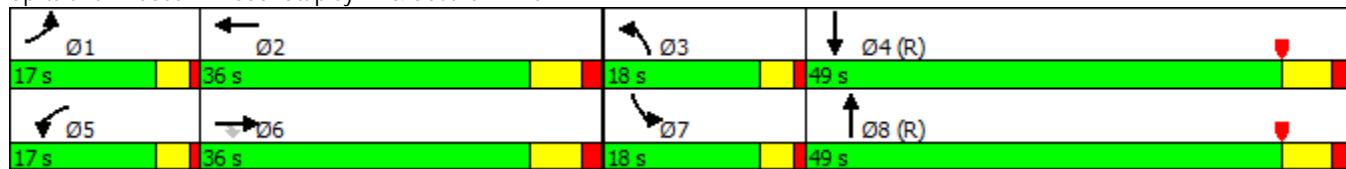
	↑	→	↓	↗	↖	↙	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑↑	↑	↑↑	↑↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑↑	↑↑
Traffic Volume (vph)	183	769	148	202	604	107	215	1138	223	189	1152	112
Future Volume (vph)	183	769	148	202	604	107	215	1138	223	189	1152	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	2		1	2		0	2		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Fr _t			0.850		0.977			0.975			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	4968	0	3433	4958	0	3433	5019	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	4968	0	3433	4958	0	3433	5019	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			161		28			39			15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2714			2628			1788			2333	
Travel Time (s)		61.7			59.7			40.6			53.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	199	836	161	220	657	116	234	1237	242	205	1252	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	199	836	161	220	773	0	234	1479	0	205	1374	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes			Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6									

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2030 Vol./Full Build Out
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0		8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		12.0	28.5		12.0	30.5	
Total Split (s)	17.0	36.0	36.0	17.0	36.0		18.0	49.0		18.0	49.0	
Total Split (%)	14.2%	30.0%	30.0%	14.2%	30.0%		15.0%	40.8%		15.0%	40.8%	
Maximum Green (s)	13.0	29.5	29.5	13.0	29.5		14.0	42.5		14.0	42.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5		3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5		0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Max		None	C-Max	
Walk Time (s)		4.0	4.0		4.0			4.0			4.0	
Flash Dont Walk (s)		23.0	23.0		18.0			18.0			20.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	11.6	33.0	30.5	12.0	33.4		12.6	47.0		12.0	46.4	
Actuated g/C Ratio	0.10	0.28	0.25	0.10	0.28		0.10	0.39		0.10	0.39	
v/c Ratio	0.60	0.60	0.31	0.64	0.55		0.65	0.75		0.60	0.70	
Control Delay	59.8	40.1	7.1	60.9	37.5		60.2	33.9		58.8	33.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	59.8	40.1	7.1	60.9	37.5		60.2	33.9		58.8	33.3	
LOS	E	D	A	E	D		E	C		E	C	
Approach Delay		38.9			42.7			37.5			36.6	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	76	208	0	85	181		90	350		79	325	
Queue Length 95th (ft)	115	255	54	127	228		132	420		118	384	
Internal Link Dist (ft)		2634			2548			1708			2253	
Turn Bay Length (ft)	198		200	188			195			195		
Base Capacity (vph)	371	1399	522	371	1403		400	1963		400	1949	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.54	0.60	0.31	0.59	0.55		0.58	0.75		0.51	0.70	
Intersection Summary												
Area Type:	Other											
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 4:SBT and 8:NBT, Start of Yellow												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.75												
Intersection Signal Delay: 38.5	Intersection LOS: D											
Intersection Capacity Utilization 68.5%	ICU Level of Service C											
Analysis Period (min) 15												

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

2040 Vol./Full Build Out
AM Peak Hour

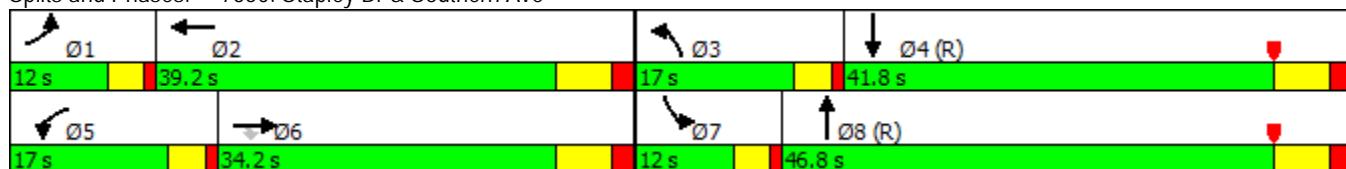
	↑	→	↓	↗	↖	↙	↖	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑↑	↑	↑↑	↑↑↑	↑↑↑	↑↑	↑↑↑	↑↑	↑↑	↑↑↑	↑↑↑
Traffic Volume (vph)	136	548	138	238	1065	84	236	914	135	118	1067	157
Future Volume (vph)	136	548	138	238	1065	84	236	914	135	118	1067	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	2		1	2		0	2		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Fr _t			0.850		0.989			0.981			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	5029	0	3433	4989	0	3433	4989	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	5029	0	3433	4989	0	3433	4989	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			193			12			29			27
Link Speed (mph)			30			30			30			30
Link Distance (ft)			2714			2628			1788			2333
Travel Time (s)			61.7			59.7			40.6			53.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	596	150	259	1158	91	257	993	147	128	1160	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	148	596	150	259	1249	0	257	1140	0	128	1331	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane			Yes			Yes			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)			94			94			94			94
Detector 2 Size(ft)			6			6			6			6
Detector 2 Type			Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)			0.0			0.0			0.0			0.0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6									

Stapley/Southern Optimization
7550: Stapley Dr & Southern Ave

2040 Vol./Full Build Out
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0		8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		12.0	28.5		12.0	30.5	
Total Split (s)	12.0	34.2	34.2	17.0	39.2		17.0	46.8		12.0	41.8	
Total Split (%)	10.9%	31.1%	31.1%	15.5%	35.6%		15.5%	42.5%		10.9%	38.0%	
Maximum Green (s)	8.0	27.7	27.7	13.0	32.7		13.0	40.3		8.0	35.3	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5		3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5		0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Min		None	C-Min	
Walk Time (s)		4.0	4.0		4.0			4.0			4.0	
Flash Dont Walk (s)		23.0	23.0		18.0			18.0			20.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	8.0	31.9	29.4	12.2	36.0		12.2	42.0		8.0	37.8	
Actuated g/C Ratio	0.07	0.29	0.27	0.11	0.33		0.11	0.38		0.07	0.34	
v/c Ratio	0.59	0.40	0.27	0.68	0.75		0.68	0.59		0.51	0.77	
Control Delay	59.8	32.9	3.1	56.7	36.4		56.5	27.8		56.9	35.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	59.8	32.9	3.1	56.7	36.4		56.5	27.8		56.9	35.1	
LOS	E	C	A	E	D		E	C		E	D	
Approach Delay		32.4			39.9			33.1			37.0	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	53	126	0	91	287		90	223		45	298	
Queue Length 95th (ft)	87	163	25	134	344		134	270		77	356	
Internal Link Dist (ft)		2634			2548			1708			2253	
Turn Bay Length (ft)	198		200	188			195			195		
Base Capacity (vph)	249	1473	564	405	1655		405	1958		249	1741	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.59	0.40	0.27	0.64	0.75		0.63	0.58		0.51	0.76	
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 0 (0%), Referenced to phase 4:SBT and 8:NBT, Start of Yellow												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.77												
Intersection Signal Delay: 36.0	Intersection LOS: D											
Intersection Capacity Utilization 73.3%	ICU Level of Service D											
Analysis Period (min) 15												

Splits and Phases: 7550: Stapley Dr & Southern Ave



Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2040 Vol./Full Build Out
PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑↑	↑	↑↑	↑↑↑		↑↑	↑↑↑		↑↑	↑↑↑	
Traffic Volume (vph)	197	829	159	218	651	115	232	1226	240	203	1242	121
Future Volume (vph)	197	829	159	218	651	115	232	1226	240	203	1242	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	198		200	188		0	195		180	195		0
Storage Lanes	2		1	2		0	2		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Fr _t			0.850		0.977			0.975			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	4968	0	3433	4958	0	3433	5019	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	4968	0	3433	4958	0	3433	5019	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			173			28			40			16
Link Speed (mph)			30			30			30			30
Link Distance (ft)			2714			2628			1788			2333
Travel Time (s)			61.7			59.7			40.6			53.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	214	901	173	237	708	125	252	1333	261	221	1350	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	214	901	173	237	833	0	252	1594	0	221	1482	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane			Yes			Yes			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)			94			94			94			94
Detector 2 Size(ft)			6			6			6			6
Detector 2 Type			Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)			0.0			0.0			0.0			0.0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6									

Stapley Drive Optimization
7550: Stapley Dr & Southern Ave

2040 Vol./Full Build Out
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	8.0	15.0		8.0	15.0		8.0	15.0	
Minimum Split (s)	12.0	33.5	33.5	12.0	28.5		12.0	28.5		12.0	30.5	
Total Split (s)	16.0	34.0	34.0	18.0	36.0		18.0	51.0		17.0	50.0	
Total Split (%)	13.3%	28.3%	28.3%	15.0%	30.0%		15.0%	42.5%		14.2%	41.7%	
Maximum Green (s)	12.0	27.5	27.5	14.0	29.5		14.0	44.5		13.0	43.5	
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5		3.0	4.5	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	-2.5	0.0	0.0	-2.5		0.0	-2.5		0.0	-2.5	
Total Lost Time (s)	4.0	4.0	6.5	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	C-Max		None	C-Max	
Walk Time (s)		4.0	4.0		4.0			4.0			4.0	
Flash Dont Walk (s)	23.0	23.0		18.0			18.0			20.0		
Pedestrian Calls (#/hr)	0	0		0			0			0		
Act Effct Green (s)	11.3	31.3	28.8	12.7	32.7		13.0	48.0		12.0	47.0	
Actuated g/C Ratio	0.09	0.26	0.24	0.11	0.27		0.11	0.40		0.10	0.39	
v/c Ratio	0.66	0.68	0.34	0.65	0.61		0.68	0.79		0.65	0.75	
Control Delay	62.8	43.1	7.5	60.4	39.1		61.2	34.6		61.1	34.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	62.8	43.1	7.5	60.4	39.1		61.2	34.6		61.1	34.2	
LOS	E	D	A	E	D		E	C		E	C	
Approach Delay		41.6			43.8			38.2			37.7	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	83	232	0	91	201		97	389		85	359	
Queue Length 95th (ft)	124	284	57	134	248		142	453		127	419	
Internal Link Dist (ft)		2634			2548			1708			2253	
Turn Bay Length (ft)	198		200	188			195			195		
Base Capacity (vph)	343	1327	511	400	1374		400	2008		371	1977	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.62	0.68	0.34	0.59	0.61		0.63	0.79		0.60	0.75	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:SBT and 8:NBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 39.8

Intersection LOS: D

Intersection Capacity Utilization 71.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 7550: Stapley Dr & Southern Ave

